



York University Senate

Notice of Meeting

Thursday, 26 May 2022, 3:00pm – 5:00pm

Via Videoconference

AGENDA

Page

- 1. **Chair’s Remarks** (M. Roy)
- 2. **Business arising from the Minutes**
- 3. **Inquiries and Communications**
- 4. **President’s Items**
 - a. Kudos Report1

10min

Committee Reports

- 5. **Executive Committee** (P. Puri)6
 - a. The Rules of Senate: Revisions (Notice of Motion)
 - b. Election of Members of Non-Designated Senate Committees and Elected Positions

25min

- 6. **Academic Standards, Curriculum and Pedagogy** (N. Richardson)31
 - a. Establishment of BSc degree program in Financial Technologies, School of Information Technology, LA&PS (Appendix A, P.38)
 - b. Authorization to house BSc degree type in Faculty of Liberal Arts & Professional Studies (Appendix B, P.112)
 - c. Establishment of BA and BSc degree programs in Data Science, Mathematics & Statistics, Faculty of Science (Appendix C, P. 113)
 - d. Addition of Types for the Diploma in Management, School of Administrative Studies, LA&PS (Appendix D, P. 191)
 - e. Revisions to the Senate Policy on Sessional Dates and the Scheduling of Examinations (Appendix E, P. 195)

25min

- 7. **Academic Policy, Planning and Research** (B. Spotton Visano) 199
 - a. Spring Report of the Provost / Vice-President Finance & Administration: 2022 Budget Context for Academic Planning (Appendix A, P.204)

40min

York University Senate

8. Academic Policy, Planning and Research / Academic Standards, Curriculum and Pedagogy..... 230

10min

- a. Report of the Sub-Committee on Quality Assurance (Appendix A, P.231)
- b. Annual Non-Degree Studies (Appendix B, P. 257)

9. Other Business

P. Robichaud, Secretary

Consent Agenda

Consent agenda items are deemed to be approved or received unless, prior to the start of the meeting, one or more Senators ask that they be dealt with as regular business.

10. Minutes of the 28 April 2022 Meeting 266

11. Revisions to the Senate Policy on Honorific Professorships 276

PRESIDENT'S KUDOS REPORT

MAY 2022



At the June 2022 Convocation ceremonies, York will honour the following twelve distinguished individuals with honorary degrees:

- Frank Vettese, business and community leader
- Elder Duke Redbird, Ojibwe artist, poet, and scholar
- Dr. Steven Stein, clinical psychologist, business leader, and philanthropist
- Steven Lewis, health care system and services innovator and researcher
- Silken Laumann, Olympic athlete and health advocate
- Terri Lyne Carrington, musician, educator, and social activist
- Olive Senior, writer, educator, and editor
- Anna Porter, publisher and author
- David Miller, environmental activist, former Metro Councillor, former Toronto Councillor and former Mayor of Toronto, lawyer, and professor
- Neil Shubin, evolutionary biologist, paleontologist, and popular science writer
- Constance Backhouse, multi-disciplinary scholar, social activist, and cultural critic
- John Van Burek, translator of theatrical works and theatrical producer



York University is strengthening its position as a leader in creating a more sustainable and inclusive world, ranking in the world's top 35 in the 2022 [Times Higher Education Impact Rankings](#) on advancing the United Nations' Sustainable Development Goals. The University placed 33rd out of 1,406 post-secondary institutions, moving up an impressive 34 spots from its position at 67th out of 1,117 post-secondary institutions in last year's rankings.



York University was selected for the 10th consecutive year as one of [Canada's Greenest Employers](#). The competition, now in its 15th year, is designed to highlight employers in Canada that are leaders in creating a "culture of environmental awareness" through "exceptional sustainability initiatives."



Faculty members of Schulich School of Business at York University have been honoured with the annual student-run [Seymour Schulich Teaching Excellence Awards](#). Of the 10 top-rated BBA and iBBA undergraduate program instructors, Alex Garber won first prize and Alex Fisher placed second. Also recognized in the top 10 undergraduate instructors are: Hila Koren Cohen, Marc Colasanti, Graeme Deans, Margaret Hastings, Ashley Konson, Dishan Ratnajothi, Althea Wishloff, and Julie Yan. In the graduate program category, Ashley Konson won first prize and Alla Volodina placed second. Also recognized in this category were Christopher Chan, Graeme Deans, Cameron Graham, Ashwin Joshi, Marisa Morriello, Andrea Stupino, Mike Valente, and Klaudia Watts.



[Lisa Cole](#), director of programming at the Lassonde School of Engineering k2i academy (kindergarten to industry academy), has been named an Ally of the Canadian Black Scientist Network (CBSN). Allies of the CBSN are leaders who affirm their commitment to actively supporting, promoting, and enabling structural change to ensure the development, recruitment, and success of Black STEM researchers within their organizations.



The Faculty of Graduate Studies Teaching Award was presented to Professor [Eric Mykhalovskiy](#), member of the Health, Science & Technology Studies, Socio-Legal Studies and Sociology graduate programs, for which he is also the graduate program director. Mykhalovskiy embodies the award's dedication to sustained excellence, commitment, and enthusiasm to teaching at the graduate level at York.



First-year York Psychology student [Nicolina Bozzo](#) made it to the top 5 competitors in the current season of *American Idol*.



[Four faculty members](#) from York University's Faculty of Health were recognized for their accomplishments in educational leadership and curricular innovation, teaching, research, and service on May 3 when the annual Dean's Awards were announced. This year's recipients are:



- Rachel da Silveira Gorman – Dean's Award for Excellence in Educational Leadership, Pedagogical, and/or Curricular Innovation
- Mary Desrocher – Dean's Award for Excellence in Teaching
- Mazen Hamadeh – Dean's Award for Excellence in Service & Engagement Impact Award
- Joseph Baker – Dean's Award for Excellence in Research



Eighteen students at York University’s Glendon Campus were recognized for their leadership in academics, as well as their contributions to the community and to Glendon. The awards and recipients at the [2021–22 Glendon Student Engagement Awards](#) include:

- Hiru Balasuriya and Stephen Teong – Margaret Wallace Leadership Award
- Brianna Carrasco and Raheela Popat – Convocation Award of Excellence for Student Leadership
- Cyrielle Ngeleka – Emerging Leader Award
- Ariana Mah – The Neal Stephenson Glendon Involvement Award
- Eden Minichiello, Josée Philips, Mae Shibasaki, and Robin Kirk – OSA Awards
- Katherine Mazzota, Marissa Buttigieg, Nadia Hayes, and Sophia Tracey – Outstanding Contribution Awards
- Victoria Matchet – Prix Molière
- Violette Daveau – Robert Wallace Award of Merit
- Drew Batchilder – Ian Bingham Memorial Award
- Taylor Johnson – John Proctor Award



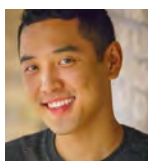
In April 2022, Dean Alice J. Hovorka presented the [Faculty of Environmental & Urban Change Dean’s Awards](#) to:



- Associate Professor Jin Haritaworn – Dean’s Teaching Award
- Associate Professor and Planning Program Coordinator Luisa Sotomayor – Dean’s Service Award
- Research Officer Rhoda Reyes – Dean’s Staff Recognition Award
- Professor Ilan Kapoor – Dean’s Research Excellence Award
- Professor and Director of The City Institute (CITY) Linda Peake – Dean’s Research Excellence Award.



The Academy of Canadian Cinema & Television announced the winners of the [2022 Canadian Screen Awards](#) during Canadian Screen Week. Four alumni from York University’s School of Arts, Media, Performance & Design received Canadian Screen Awards in five categories:



- Mumbi Tindiebwa Otu (BA ’10 Theatre): Best Web Program or Series, Fiction – *21 Black Futures*
- Bill Halliday (BFA ’00 Film and Video): Best Visual Effects – *Vikings – The Signal*
- Ari Posner (BFA ’92 music): Best Original Music, Animation – *Let’s Go Luna! – The Way of the Gaucho*
- Franco Nguyen (BFA ’10 Film Production): Best Writing, Variety or Sketch Comedy – *TallBoyz – You’re The Dads Now!*
- Franco Nguyen (BFA ’10 Film Production): Best Performance, Sketch Comedy (Individual or Ensemble) – *TallBoyz*



[Dr. Reena Shadaan](#), PhD in Environmental Studies alumna, received the 2020–2021 Mary McEwan Memorial Award from the Centre for Feminist Research. The Mary McEwan Memorial Award is presented annually to one PhD dissertation produced at York University in the area of feminist scholarship.



Schulich alumnus [Abhinav Singhvi](#) (MBA '20) is one of the *Globe and Mail's* Report on Business 2022 Best Executives. The 50 winners chosen for 2022 represent the best of Canadian leadership in five functional areas: Finance; Human Resources; Operations; Sales and Marketing; and Technology.



York University Professor [Jane Heffernan](#), Department of Mathematics & Statistics in the Faculty of Science, has been elected as the next president of the Society for Mathematical Biology, the largest and only international society in its field. Her position commences in Summer 2022. Heffernan is an international leader in infectious disease modelling.



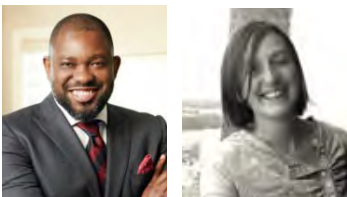
[Pirathayini Srikantha](#), Assistant Professor in the Department of Electrical Engineering & Computer Science at the Lassonde School of Engineering, will receive the 2022 Ontario Professional Engineers Awards Engineering Medal in the Young Professional category. The Young Engineer Medal honours an outstanding Ontario engineer who has made exceptional achievements in their chosen field and has demonstrated excellence, not only in their career, but also through community and professional participation.



The Ontario government has awarded the 2021 David Walter Mundell Medal for excellence in legal writing to Osgoode Hall Law School Professor [Philip Girard](#). Girard is one of Canada's preeminent legal historians. His extensive work, including many important books, has made a significant contribution to scholarship in Canadian legal history.



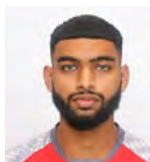
[Two York University researchers](#) have received research awards from the Government of Canada's New Frontiers in Research Fund. Professor Natalia Balyasnikova (Faculty of Education) is the principal investor on the "PhoneMe app: An innovative research approach to community literacy" project, and Professor Heidi Matthews (Osgoode Hall Law School) is the principal investigator on the "Community Science and Accountability for Canada's Colonial Genocide Past and Present" project.



The Social Sciences and Humanities Research Council of Canada awarded funding to Liberal Arts & Professional Studies researchers [Akolisa Ufodike and Andrea Emberly](#) through the Race, Gender, and Diversity Initiative, which funds community-led research partnerships grounded in the lived experience of underrepresented or disadvantaged groups that analyze the causes of systemic racism and discrimination.



[Joel Robertson-Taylor](#), who will enter his second year at Osgoode Law School in September, is one of 14 international law students selected for a 2022 Fellowships at Auschwitz for the Study of Professional Ethics fellowship. The fellowships are provided to students and early-stage practitioners in law, business, journalism, design and technology, medicine, and seminary.



York University student-athletes were in the spotlight during the 54th [Varsity Athletics Awards](#), held during the last week in April. The 2022 award winners include:

- Male Athlete of the Year: Dieu Merci Yuma, soccer
- Female Athlete of the Year: Leah Jones, track & field
- Outstanding Male Graduate Award: Dan Everton, volleyball
- Bryce M. Taylor Award: Ellen Donaldson, hockey
- Charles Saundercook Memorial Trophy: Kelsey McHolm, women's hockey
- 2022 Lions Legacy Award: Ellen Donaldson, women's hockey
- 2022 Lions Legacy Award: Dan Everton, men's volleyball
- 2022 Lions Legacy Award: Lauren Walter, Women's rugby
- Male Rookie of the Year: Jasraj Nijjar, volleyball
- Female Rookie of the Year: Kiara Leveridge, basketball
- Coach of the Year: Carmine Isacco, soccer
- Sport Council Award: Courtney Gardiner, women's hockey
- Student Therapist of the Year: Alexandria Boussey
- Roar Cup: Field Hockey Team



The [York Centre for Asian Research](#) celebrated its 20th anniversary of advancing the study of Asia and Asian diasporas with a presentation titled “Reimagining Chinese Diasporas Studies in a Transnational World.” The presentation was given by transnational academic and scholar Shibao Guo, who over the past 20 years has developed research expertise in the areas of transnational migration, diaspora studies, Chinese immigrants in Canada, ethnic and race relations, and comparative and international education.

APPOINTMENTS



[Dr. David Peters](#) has been appointed to the position of Dean, Faculty of Health for a five-year term, effective January 1, 2023.



[Sheril Hook](#) has been appointed Associate Dean for Teaching and Learning at York University Libraries, effective May 16, 2022.

Executive Committee – Report to Senate

At its meeting of 26 May 2022

Notice of Statutory Motion

a. Amendments to the Rules of Senate

It is the intention of Senate Executive to put the following statutory motion to Senate:

“that Senate approve amendments to the York University Rules of Senate as set out in Appendix A.”

Rationale

Consistent with the requirement to publish updated Senate Rules every three years (Section 7.5), one of Senate Executive’s priorities for the year has been a Rules review.

In December, the preliminary inventory of suggestions for this year’s Rules review exercise was distributed to Senators with a call for additional suggestions. The scope of the review was confirmed by Executive in January. Draft revisions to the Rules are set out in Appendix A with changes marked in red text with corresponding rationales provided for each section changes.

There are three key aspects to the revisions being proposed at this time:

- changes to various sections within the body of the Rules to enhance clarity on certain matters
- change to the membership of Senate to add the new position of Deputy Provost, Markham Campus
- changes to the *Senate Nominations Rules and Procedures*, Appendix C to the Rules

Over the course of several meetings this spring, the Committee discussed the revisions to the Rules and principles to guide decisions on the composition and size of Senate. A preliminary discussion of the recommended changes with Senate in May allows for first reflections to be shared and deliberated, and a final considered document brought back for approval in June.

FOR ACTION

b. Nominees for Election to Senate Committees and Senate-elected Positions

Senate Executive recommends that Senate confirm the following candidates for election to Senate Committees (non-designated seats) for three-year terms beginning 1 July 2022 and ending 30 June 2025, and for the position of Senator on the Board of Governors for a two-year term between 1 July 2022 – 30 June 2024. The call for nominations to fill the

Executive Committee – Report to Senate

vacancies for the various Senate elected seats was issued on 22 April with submissions received through to 6 May. Nominations are also accepted “from the floor” if the nominee has consented and is available for the published meeting time of the committee. Under Senate Rules, nominators must report prospective nominees to the Secretary prior to the start of the Senate meeting in order to determine their eligibility.

The Committee confirms that all the candidates nominated have met the eligibility requirements for the committee or position.

I. Senate Nominee for Membership on the Board of Governors

(Full-time faculty member; 1 vacancy; two-year term; must be a member of Senate to stand for election) Board of Governors normally meets five times each year; Senate Executive meets on the third Tuesday each month at 3:00 p.m.; Senate meets on the fourth Thursday of the month at 3:00 p.m.

Marie-Hélène Budworth, Associate Professor, School of Human Resource Management, Faculty of Liberal Arts & Professional Studies

II. Academic Colleague to the Council of Ontario Universities

(Full-time faculty member; 1 vacancy; two year term; Senate meets on the fourth Thursday of the month at 3:00 p.m.; Academic Policy, Planning and Research Committee meets every other Thursday at 9:30 a.m. from September to June)

William van Wijngaarden, Professor, Physics & Astronomy, Faculty of Science

III. Senate Committees

Academic Standards, Curriculum and Pedagogy (Contract faculty member; 1 vacancy; one-year term; ASCP meets Wednesdays at 1:30 p.m., normally twice each month)

Julie Allen, Department of Philosophy, Faculty of Liberal Arts & Professional Studies

Academic Standards, Curriculum and Pedagogy (Librarian/ Archivist member; 1 vacancy; ASCP meets Wednesdays at 1:30 p.m., normally twice each month)

Note: 1 vacancy remains

Appeals (Full-time faculty members; 4 vacancies¹; meets in panels at the call of the Chair)

Ada Chan, Associate Professor, Mathematics & Statistics, Faculty of Science

Ruth Rodney, Assistant Professor, School of Nursing, Faculty of Health

Sonya Scott, Assistant Professor, Social Science, Liberal Arts & Professional Studies

Jessica Sutherland, Assistant Professor, Psychology, Faculty of Health

¹ An additional vacancy was reported after Executive issued its *Call for Expressions of Interest*

Executive Committee – Report to Senate

Awards (Full-time faculty members; 3 vacancies) (Meets 4-5 times annually; Friday)

Nergis Canefe, Associate Professor, Politics, Liberal Arts & Professional Studies

Note: 2 vacancies remain

Joint Sub-Committee on Quality Assurance (Full-time faculty members, 1 vacancy, inaugural year for the new structure and composition of the Sub-committee)

Note: 1 vacancy remains

Tenure and Promotions (Full-time faculty members; 9 vacancies; meets in panels on Thursdays at 3:00 when Senate is not in session; members participate in the deliberations of committees constituted at the Faculty level; candidates must fulfil all membership criteria)

Celina da Silva, Associate Professor, School of Nursing, Faculty of Health

Miriam Smith, Professor, Social Science Department, LA&PS

Chen-Wei (Jackie) Wang, Associate Lecturer, EECS, Lassonde School of Engineering

Note: 6 vacancies remain

Tenure and Promotions Appeals (Full-time faculty members; 1 vacancy; meets at the call of the Chair as needed; candidates must fulfil all membership criteria).

Roger Fisher, Associate Professor, Humanities, Liberal Arts & Professional Studies

FOR INFORMATION

c. Monitoring the Pandemic Disruption

At its April meeting, Senate engaged in a discussion of the considerations to weigh in declaring the end of the current pandemic-caused disruption. The Executive Committee reviewed the helpful input provided by Senators and this month continued its discussion of the timing and process for declaring an end to the pandemic-caused disruption to activities.

There are many aspects, concerns and protections to be contemplated in this decision. The pandemic has caused considerable challenges in many forms for the University and its community; its impact can neither be taken lightly nor assumed to be over. Senate Executive wants to proceed with due care and diligence in determining when the Disruptions policy no longer needs to be in effect. A communication from the Committee on the approach it is taking to this decision will be issued in early June.

Executive Committee – Report to Senate

d. Review of Faculty Council Rules and Procedures

The Executive Committee reviewed and endorsed minor changes to the rules and procedures for the Faculty Council of Osgoode Hall Law School.

The Committee also reviewed draft revisions to the rules and procedures of the Faculty of Graduate Studies' Faculty Council to provide feedback on changes being contemplated following the transfer of graduate program resourcing, program development and related collegial governance responsibilities to the anchor Faculties, and the concomitant change to FGS Council's mandate. Once finalized by FGS Council, the set of changes will be transmitted to Senate Executive for confirmation.

e. 2021-2022 Senator and Senate Committee Survey

The annual survey of Senators and Senate committee members is being conducted at this time, with the exercise set to launch in late May 2022. While the survey questions employed in recent years will remain unchanged to facilitate the assessment of trends and comparative results, Senators and Senate committee members will be canvassed again this year for input on their experiences with governance being delivered virtually. A supplemental set of questions on this topic has been added to the survey. The Executive Committee will receive and assess the results and share reflections with Senate thereafter. The Senate and committee feedback on the virtual meeting mode employed for the past two years will inform post-pandemic governance planning.

Mario Roy, Chair
Poonam Puri, Vice-Chair

Existing Rules of Senate Sections	Draft Revisions (New / revised text in red)	Rationale for the Change
<p>1. RESPONSIBILITIES, POWERS AND PRINCIPLES OF SENATE</p> <p>1.3 The following principles inform the rules of Senate, and the interpretation and application of the rules shall be consistent with these principles:</p> <p>b. Senate is open to the University community unless it duly resolves to move into closed session.</p>	<p>1. RESPONSIBILITIES, POWERS AND PRINCIPLES OF SENATE</p> <p>1.3 The following principles inform the rules of Senate, and the interpretation and application of the rules shall be consistent with these principles:</p> <p>b. Senate is open to the University community unless it duly resolves to move into closed session. Community access to Senate meetings held virtually will be facilitated by livestreaming or a comparable online option.</p>	<p>Revision in alignment with new option of the virtual mode of delivery for Senate meetings.</p>
<p>Matters Not Covered by These Rules</p> <p>1.6 These rules are intended to be comprehensive. When an issue not foreseen by these rules arises, the Chair, in keeping with the principles outlined in the preamble, shall make a ruling or consult with Senate Executive. The Chair shall report at the next meeting of Senate, which may consider what action to amend these rules and procedures, if any, should occur.</p>	<p>Matters Not Covered by These Rules</p> <p>1.6 These rules are intended to be comprehensive. When an issue not foreseen by these rules arises the Chair, in keeping with the principles outlined in the preamble, shall normally consult with Senate Executive prior to making a ruling. The Chair shall report on the issue at the next meeting of Senate, which may consider what action to amend these rules and procedures, if any, should occur.</p>	<p>Editorial revision for clarity and alignment with established practice.</p>

<p>2. MEMBERSHIP OF SENATE</p> <p>Duties of the Vice-Chair</p> <p>2.4 The Vice-Chair of Senate assists the Chair in giving leadership to Senate, serves as the vice-chair of the Senate Executive Committee, and presides at meetings of Committee of the Whole. In the absence of the Chair, the Vice-Chair may exercise any and all powers and authorities of the Chair. The Vice-Chair of Senate succeeds the Chair at the expiration of the Chair’s term or in the event of the Chair’s resignation. The Vice-Chair is the Chief Teller for all votes at Senate meetings.</p>	<p>2. MEMBERSHIP OF SENATE</p> <p>Duties of the Vice-Chair</p> <p>2.4 The Vice-Chair of Senate assists the Chair in giving leadership to Senate, serves as the Vice-Chair of the Senate Executive Committee, and presides at meetings of Committee of the Whole. In the absence of the Chair, the Vice-Chair may exercise any and all powers and authorities of the Chair. The Vice-Chair of Senate succeeds the Chair at the expiration of the Chair’s term or in the event of the Chair’s resignation. The Vice-Chair is the Chief Teller for all votes at Senate meetings where in-person voting is conducted by paper ballot or a show of hands.</p>	<p>Revision in alignment with new option of virtual mode of Senate meetings and the use of e-polls in Senate meetings.</p>
<p>Eligibility for the Election of Faculty Members</p> <p>2.2. All full-time and contract faculty members are eligible for membership on Senate. [October 27, 1994]</p>	<p>Election of Faculty Members</p> <p>2.2 All full-time and contract faculty members are eligible for membership on Senate.</p> <p>2.3. Faculty Councils are responsible for reporting the results of their elections of full-time and contract faculty member representatives on Senate.</p>	<p>Revision to make an implicit process step explicit for clarity.</p>

<p>Failure to Attend Meetings, Temporary Absences and Resignation</p> <p>2.14 Senators holding an elected seat who wish to retain their Senate seat while on leave for a term or more shall so inform the Secretary of the University, in writing, by April 1 of the academic year preceding the one in which leave is to be taken. Senators on leave who do not inform the Secretary of their intentions shall be deemed to have resigned their seats.</p>	<p>Failure to Attend Meetings, Temporary Absences and Resignation</p> <p>2.15 Senators holding an elected seat who wish to retain their Senate seat while on leave for a term or more (including sabbaticals) shall so inform the Secretary of the University, in writing, by April 1 of the academic year preceding the one in which leave is to be taken. Senators on leave who do not inform the Secretary of their intentions shall be deemed to have resigned their seats.</p>	<p>Editorial revision for clarity.</p>
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<p>3. MEETINGS OF SENATE</p> <p>Open and Closed Sessions</p> <p>3.14 Meetings of Senate are open to members of the University community, subject to the availability of space. [October 24, 1968 affirmed by Senate Executive, June 2001]</p> <p>3.15 When Senate considers matters relating to specific individuals or to other matters where confidentiality must be observed, the Executive Committee may, in the notice for a meeting, declare part of a meeting to be closed.</p>	<p>3. MEETINGS OF SENATE</p> <p>Open and Closed Sessions</p> <p>3.14 Meetings of Senate held in-person or in hybrid¹ mode are open to members of the University community, subject to the availability of physical space. Meetings of Senate held exclusively in virtual mode will normally be restricted to Senators to ensure the integrity of voting. Virtual meetings will be livestreamed for members of the University community to observe the proceedings.</p> <p>3.15 In the event extenuating circumstances prevent a meeting from proceeding in the planned in-person or in hybrid mode, the decision will be made by the Chair of Senate, with the advice of the Executive Committee where possible, to move the meeting to a virtual mode of delivery.</p> <p>3.16 When Senate considers matters relating to specific individuals or to other matters where confidentiality must be observed, the Executive Committee may, in the notice for a meeting, declare part of a meeting to be closed in camera.</p>	<p>Revision, including the new 3.15 sub-section is in alignment with new options of virtual and hybrid modes of delivery for Senate meetings.</p> <p>The intention of 3.15 is to provide for the option to change to a virtual mode for a Senate in meeting in events such as a weather emergency.</p> <p>Note: with the addition of 3.15, the subsequent sub-sections in Section 3 will be re-numbered in the final version of the Rules.</p>
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¹ Hybrid meetings combine in-person and virtual modes of delivery.

<p>4. MOTIONS</p> <p>4.3 Hortative motions express Senate’s opinion on matters lying outside its jurisdiction [Amended October 26, 2006 amended February 25, 2016]</p> <p>Notice of Motion</p> <p>4.5 Substantive and hortative motions intended for Senate’s consideration at its regular monthly meeting or special meeting of Senate must be submitted to the Executive Committee for consideration at its regular monthly meeting, which is normally held in the two weeks prior to regular meetings of Senate.</p>	<p>4. MOTIONS</p> <p>4.3 Hortative motions express Senate’s opinion on matters lying outside its jurisdiction. Senate opinions expressed through a hortative motion are advisory in nature and do not require action to be taken.</p> <p>Notice of Motion</p> <p>4.5 Substantive and hortative motions intended for Senate’s consideration at its regular monthly meeting of Senate must be submitted to the Executive Committee for consideration at its regular monthly meeting, which is normally held in the two weeks prior to regular meetings of Senate. Substantive and hortative motions intended for consideration at a special meeting of Senate must be submitted to the Executive Committee for consideration prior to the finalization of the agenda for the special meeting.</p>	<p>Expanded section to provide fuller information on hortative motions.</p> <p>Expanded to clarify the distinction between and separate process timelines for regular monthly meetings and special meetings of Senate.</p>
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Determining That Motions Are in Order

4.7 The Chair, with the advice of the Executive Committee, is responsible for determining if motions submitted for Senate’s consideration in advance of regular or special meetings by committees, Councils, Senators and others are in order.

4.9 All rulings by Senate Executive that a motion is out of order will be reported to Senate by the Chair together with a rationale for the ruling. Any such ruling is subject to appeal.

4.10 Substantive and hortative motions for which notice has not been given must be delivered to the Chair in writing before the commencement of a meeting for a determination whether or not a motion is in order.

Determining That Motions Are in Order

4.7 The Chair, with the advice of the Executive Committee, is responsible for determining if motions submitted for Senate’s consideration in advance of regular or special meetings by committees, Councils, Senators and others are in order.

4.9 All rulings by **the Chair of Senate** that a motion is **not in** order will be reported to Senate by the Chair together with a rationale for the ruling. Any such ruling is subject to appeal.

4.10 Substantive and hortative motions for which notice has not been given **to Senate Executive [as set out in Paragraph 4.5]** must be delivered to the Chair in writing **at least one business day** before the commencement of a meeting for a determination whether a motion is in order; **the Chair has discretion to exercise flexibility on the deadline.**

4.7 and 4.9:

Revisions to bring symmetry on process set out in the two sub-sections of 4.7. and 4.9, where currently confusing.

Revisions to give the Chair the necessary time to consult Senate Executive, and protect against spur of the moment decisions being made by the Chair and providing Senate sufficient time advance to consider matters brought for approval.

<p>Amendments</p> <p>4.17 The Chair shall rule out of order any amendment which would negate or substantially alter the main motion.</p>	<p>Amendments</p> <p>4.17 The Chair shall rule out of order any amendment which would negate or substantially alter the intent of the main motion.</p>	<p>Editorial revision for clarity</p>
<p>Procedural Motions</p> <p>4.37 Procedural motions require a mover and seconder and take precedence over the substantive or hortative motions which are under consideration at the time they are moved.</p>	<p>Procedural Motions</p> <p>4.37 Procedural motions require a mover and seconder and take precedence over the statutory, substantive or hortative motions which are under consideration at the time they are moved.</p>	<p>The Rules are silent about the precedence over statutory motions. Revision to incorporate reference to them for completeness.</p>
<p>Motion to Introduce Business for Which Due Notice Has Not Been Given</p> <p>4.48 A motion to introduce new business without due notice is in order only if a written copy of the motion is filed with the Chair before the meeting commences so that the Chair may determine if the motion is in order and may inform Senators at the beginning of the meeting as to the business to be considered at the meeting.</p>	<p>Motion to Introduce Business for Which Due Notice Has Not Been Given</p> <p>4.48 A motion to introduce new business without due notice is in order only if a written copy of the motion is filed with the Chair at least one day before the meeting commences so that the Chair may determine if the motion is in order and may inform Senators at the beginning of the meeting as to the business to be considered at the meeting. The Chair has discretion to exercise flexibility on the deadline.</p>	<p>As stated above for Sub-section 4.10, revisions to give the Chair the necessary time to consult Senate Executive and protect against spur of the moment decisions being made by the Chair and providing Senate sufficient time advance to consider matters brought for approval.</p>

<p>5. DEBATES AND MOTIONS</p> <p>5.6 Votes must be cast in person.</p> <p>5.8 When a question has been called, no motion can be made and no other intervention or discussion is permitted until the tally is completed and the results announced.</p>	<p>5. DEBATES AND MOTIONS</p> <p>5.6 Votes can only be cast by Senators in attendance at a meeting, whether in a virtual or in-person mode of delivery.</p> <p>5.8 When a question has been called, no motion can be made, and no other intervention or discussion is permitted until voting is completed and the results announced.</p>	<p>Revisions in alignment with the new option on virtual mode of Senate meetings and the use of e-polls in Senate meetings.</p>
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<p>7. STATUTES, RULES, POLICIES AND PROCEDURES</p> <p>Changes to the Rules, Procedures & Guidelines</p> <p>7.5 Not less frequently than every three years an updated version of the Rules Procedures and Guidelines shall be published online.</p> <p>7.6 Nothing shall be included in Rules Procedures and Guidelines that purports to be a statute, by- law, rule or regulation of the Senate unless that statute, by-law, rule or regulation has been adopted by express resolution of the Senate.</p> <p>7.7 No modifications of Rules Procedures and Guidelines shall be made unless any and all amendments, revisions, alterations, or changes have been included in the body of a Senate Agenda and adopted by express resolution of the Senate.</p>	<p>7. STATUTES, RULES, POLICIES AND PROCEDURES</p> <p>Changes to the Rules of Senate</p> <p>7.5 Not less frequently than every three years an updated version of the Rules of Senate shall be published online.</p> <p>7.6 Nothing shall be included in Rules of Senate that purports to be a statute, by- law, rule or regulation of the Senate unless that statute, by-law, rule or regulation has been adopted by express resolution of the Senate.</p> <p>7.7 No modifications of the Rules of Senate shall be made unless any and all amendments, revisions, alterations, or changes have been included in the body of a Senate Agenda and adopted by express resolution of the Senate.</p>	<p>Edits to update old reference to Senate “Rules, Procedures and Guidelines” to simply “Rules of Senate”.</p>
<p>8. SENATE COMMITTEES</p> <p>Faculty Councils</p> <p>8.6 Changes to the rules and procedures of Councils shall be reviewed by the Executive Committee to ensure their compliance with recognized principles and practices.</p>	<p>8. SENATE COMMITTEES</p> <p>Faculty Councils</p> <p>8.6 Changes to the rules and procedures of Councils shall be reviewed and approved by the Executive Committee to ensure their compliance with recognized principles and practices and general consistency across the Faculty Councils.</p>	<p>Revision to the process governing the review of changes to Faculty Council Rules to enhance the oversight role of Executive on this matter.</p>

Student Membership on the Councils of Faculties and Colleges

8.8 The number of student members of each of the Councils of Faculties and Colleges is determined by the respective Councils on the understanding that:

- a. the number of student members on Councils of undergraduate Faculties and Colleges not exceed fifteen percent (15 per cent) of the total voting membership of each of those Councils, and
- b. the number of student members on Councils of graduate Faculties and Colleges (including the Osgoode Hall Law School) not exceed twenty-five percent (25 per cent) of the total voting membership of each of those Councils. [January 1969]

Student Membership on Faculty Councils of ~~Faculties and Colleges~~

8.8 The number of student members of each of the **Faculty** Councils of ~~Faculties and Colleges~~ is determined by the respective Councils on the understanding that:

- ~~a. the number of student members on Councils of undergraduate Faculties and Colleges not exceed fifteen percent (15 per cent) of the total voting membership of each of those Councils; and~~
- a. the number of student members on **Faculty** Councils of graduate Faculties and Colleges (including the Osgoode Hall Law School) not exceed twenty-five percent (25 per cent) of the total voting membership of each of those Councils. [January 1969]

Updates to student composition on Faculty Councils to reflect current Faculty / School / College structures and the devolution of graduate curriculum functions to anchor Faculties.

<p>Nomination Process</p> <p>8.18 Additional candidates not included in the recommendations made by the Executive Committee may be nominated by Senators at Senate meetings. Such candidates must be eligible for membership, willing to serve and available at the standing meeting time of the committee. The names of individuals nominated in this manner shall be communicated to the Secretary of Senate in advance of the meeting in order to determine if prospective additional candidates are eligible.</p>	<p>Nomination Process</p> <p>8.18 Additional candidates not included in the recommendations made by the Executive Committee may be nominated by Senators at Senate meetings. Such candidates must be eligible for membership, willing to serve and available at the standing meeting time of the committee. The names of individuals nominated in this manner should normally be communicated to the Secretary of Senate at least one day in advance of the meeting to determine those additional candidates' eligibility.</p>	<p>Similar to sub-sections 4.10 and 4.48, in order to give reasonable time to confirm the validity of a nomination while not unduly delaying the proceedings of a meeting.</p>
<p>Chairs and Vice-Chairs of Committees</p> <p>8.23 Each Senate committee and legislated sub-committee elects a Chair and Vice-Chair from among its members. Vice-Chairs are responsible for assisting Chairs in the performance of their duties and assuming the duties of Chair in the following year.</p>	<p>Chairs and Vice-Chairs of Committees</p> <p>8.23 Each Senate committee and legislated sub-committee elects a Chair and Vice-Chair from among its members. Vice-Chairs are responsible for assisting Chairs in the performance of their duties and assuming the duties of Chair in the following year. On occasions where the Chair is temporarily unavailable a member of the Committee / sub-committee will serve as Acting Chair.</p>	<p>The practice of Senate committees electing vice-chairs has fallen off during the last decade. Revision proposed to so that there is a not a departure from the requirement of the Rules. Assessment of the change can be made in next Rules review.</p>

<p>General Rules Regarding Committee Membership</p> <p>8.25 Members of standing committees going on leave will be deemed to have resigned their seats.</p>	<p>General Rules Regarding Committee Membership</p> <p>8.25 Members of standing committees going on leave (including sabbaticals of six-months or longer) will be deemed to have resigned their seats.</p>	<p>Editorial revision for clarity.</p>
<p>Appendix A Membership of Senate</p> <p>1.2 Membership of Senate as Determined by Resolution of Senate</p> <p>For the period July 1, 2021 to June 30, 2023 the membership of Senate shall be a maximum of 168 as follows...</p> <p>1.2 Membership of Senate as Determined by Resolution of Senate</p> <p>For the period July 1, 2019 to June 30, 2021 the membership of Senate shall be a maximum of 168 as follows:</p> <p>1.2.1 <u>Members specified by the York Act (Total of 21)</u></p> <p>Chancellor (1) President (1) Vice-Presidents (5) Deans and Principal (11) Dean of Libraries (1) Two-to-four members of Board (2)</p>	<p>Appendix A Membership of Senate</p> <p>1.2 Membership of Senate as Determined by Resolution of Senate</p> <p>For the period July 1, 2021 to June 30, 2023 the membership of Senate shall be a maximum of 169 as follows...</p> <p>1.2 Membership of Senate as Determined by Resolution of Senate</p> <p>For the period July 1, 2019 to June 30, 2021 the membership of Senate shall be a maximum of 168 as follows:</p> <p>1.2.2 <u>Members specified by the York Act (Total of 21)</u></p> <p>Chancellor (1) President (1) Vice-Presidents (5) Deans and Principal (11) Dean of Libraries (1) Two-to-four members of Board (2)</p>	<p>To add to the composition of Senate the Deputy Provost Markham. The Deputy Provost is the lead academic administrator of the campus. The incumbent will have authority delegated by Deans to support the smooth delivery of academic programs and student services. Within the University's organizational chart, the Deputy Provost position is comparable to a decanal position. Accordingly, it is proposed to integrate the position into the Senate membership.</p> <p>To contain the size of Senate and sustain the current balance of administration and elected faculty members, it is proposed to remove the Secretary of Senate as a voting member coincident with the addition of the Deputy Provost Markham</p>

<p><u>1.2.2 Faculty Members Elected by Faculty Councils (Total of 99)</u> Arts, Media, Performance and Design 7 (minimum of 2 chairs) Education 4 Environmental Studies 4 Glendon 8 (minimum of 1 Chair) Health 12 (minimum of 2 Chairs) Lassonde 8 (minimum of 1 Chair) Liberal Arts & Professional Studies 36 (minimum of 13 Chairs and 2 contract faculty members) Osgoode 4 Schulich 5 Science 11 (minimum of 2 Chairs) Librarians (Total of 2)</p> <p><u>1.2.3 Students (Total of 28)</u> 2 for each Faculty except 6 for LA&PS Graduate Student Association (1) York Federation of Students (1)</p> <p><u>1.2.4 Other Members (Total of 13)</u> Chair of Senate (1) Vice-Chair of Senate (1) Secretary of Senate (1) Academic Colleague (1) President of YUFA (1) with designated alternate YUSA Member (1) with designated alternate Member of CUPE 3903 (1) with a designated alternate</p>	<p><u>1.2.2 Faculty Members Elected by Faculty Councils (Total of 99)</u> Arts, Media, Performance and Design 7 (minimum of 2 chairs) Education 4 Environmental Studies 4 Glendon 8 (minimum of 1 Chair) Health 12 (minimum of 2 Chairs) Lassonde 8 (minimum of 1 Chair) Liberal Arts & Professional Studies 36 (minimum of 13 Chairs and 2 contract faculty members) Osgoode 4 Schulich 5 Science 11 (minimum of 2 Chairs) Librarians (Total of 2)</p> <p><u>1.2.3 Students (Total of 28)</u> 2 for each Faculty except 6 for LA&PS Graduate Student Association (1) York Federation of Students (1)</p> <p><u>1.2.4 Other Members (Total of 13)</u> Chair of Senate (1) Vice-Chair of Senate (1) Deputy Provost, Markham Campus (1) Academic Colleague (1) President of YUFA (1) with designated alternate YUSA Member (1) with designated alternate Member of CUPE 3903 (1) with a designated alternate</p>	<p>Campus, but include the Secretary as an ex-officio, non-voting member.</p>
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<p>Alumni (2) College Heads (1) University Registrar (1) Vice-Provost Academic (1) Vice-Provost Students (1)</p> <p><u>1.2.5 Chairs of Senate Committees who are not otherwise Senators</u> (Estimated maximum of 5)</p>	<p>Alumni (2) College Heads (1) University Registrar (1) Vice-Provost Academic (1) Vice-Provost Students (1)</p> <p><u>1.2.5 Chairs of Senate Committees who are not otherwise Senators</u> (Estimated maximum of 5)</p> <p>1.2.6 <u>Ex-officio, Non-Voting Secretary of Senate</u> (1)</p>	
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<p>Appendix B Standing Committees of Senate</p> <p>2. ACADEMIC STANDARDS, CURRICULUM AND PEDAGOGY</p> <p>Composition</p> <p>1.1. The Committee is composed of the following members:</p> <p>a. Voting Members Seven faculty members elected by Senate One Librarian or Archivist elected by Senate Two student Senators, normally one undergraduate and one graduate One contract faculty member elected by Senate Chair of Senate Vice-President Academic and Provost (or delegate) Dean and Associate Vice-President Graduate (or delegate) Associate Vice-President Teaching and Learning University Registrar (or delegate) President</p> <p>b. Non-Voting Members Dean of Libraries (or delegate) Vice-Provost Students Secretary of Senate</p>	<p>Appendix B Standing Committees of Senate</p> <p>2. ACADEMIC STANDARDS, CURRICULUM AND PEDAGOGY</p> <p>Composition</p> <p>1.1 The Committee is composed of the following members:</p> <p>a. Voting Members Seven faculty members elected by Senate One Librarian or Archivist elected by Senate Two student Senators, normally one undergraduate and one graduate One contract faculty member elected by Senate Chair of Senate Provost and Vice-President Academic (or delegate) Dean and Associate Vice-President Graduate (or delegate) Associate Vice-President Teaching and Learning University Registrar (or delegate) President</p> <p>b. Non-Voting Members Dean of Libraries (or delegate) Vice-Provost Students Secretary of Senate (or delegate)</p>	<p>Revision for alignment with decisions of the Dean of Libraries and Vice-Provost Students to not participate on the committee, having the Librarian and University Registrar be the area designates respectively.</p>
<p>5. EXECUTIVE</p> <p>Terms of Reference</p> <p>5.8 The Executive Committee shall be responsible for convening at least one meeting each year of all Senate committee chairs and vice chairs.</p>	<p>5. EXECUTIVE</p> <p>Terms of Reference</p> <p>5.8 The Executive Committee shall be responsible for convening at least one meeting each year of all Senate committee chairs and vice chairs.</p>	<p>See rationale for revision to on sub-section 8.23 above.</p>

<p>Sub-Committees of Executive Committee</p> <p>Sub Committee on Equity</p> <p>Mandate</p> <p>5.12 The Sub Committee on Equity is responsible for reviewing, recommending revisions to, and proposing and pursuing policies in the domain of equity that are within Senate’s mandate, either through its own initiative or by coordinating the work of Senate committees. It shall facilitate the consideration of equity matters and serve for Executive as Senate’s liaison with other bodies of the University. The Sub-Committee will report twice annually to Senate on equity issues and report to bodies such as the President’s Advisory Council on Human Rights. The Sub Committee shall also ensure that other Senate committees act and report on aspects of their mandates that relate to equity. In discharging its mandate, the Sub Committee shall seek such advice as is necessary and desirable.</p> <p>Composition</p> <p>5.13 The sub-committee is composed of the following members:</p> <p>Chair of Senate (or delegate)</p>	<p>Sub-Committees of Executive Committee</p> <p>Sub Committee on Equity</p> <p>Mandate</p> <p>5.12 The Sub-committee on Equity is responsible for reviewing, recommending revisions to, and proposing and pursuing policies in the domain of equity that are within Senate’s mandate. Through a coordinating function, the Sub-committee also promotes action to be taken by other Senate committees on aspects of their mandates that relate to equity, recommending initiatives and policy changes to the committees, and regular reporting to Senate on the integration of equity considerations. In discharging its mandate, the Sub-committee seeks such advice from and communicates with central equity bodies, Faculty Councils and their committees, as is necessary and desirable.</p> <p>Composition</p> <p>5.13 The Sub-Committee is composed of the following members:</p> <p>Chair of Senate (or delegate)</p>	<p>The proposed revisions to the mandate and composition are recommended by the Equity Sub-committee. Over the course of two meetings this term, it reviewed and discussed its mandate and membership.</p> <p>The mandate has been updated for clarity on the role of the sub-committee in sustaining the advancement of equity matters within the realm of Senate, and to reflect current EDI developments, structures and plans at the University.</p> <p>The addition of the Vice-President Equity, People and Culture to the membership facilitates and informs the integration of institutional planning within Senate</p>
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<p>Secretary of Senate (or delegate)</p> <p>Other Members of Senate Executive (normally including one student)</p> <p>Member of Academic Policy, Planning and Research</p> <p>Member of Academic Standards, Curriculum and Pedagogy</p> <p>Reporting</p> <p>5.14 The Sub Committee’s reports to Senate Executive will be a standing item on the agenda of Senate Executive Committee, and the Sub Committee is required to inform Senate Executive of its activities on a regular basis. The Sub Committee will file its twice annual reports after consulting with other Senate committees.</p> <p>5.15 In addition to members from Senate Executive, the membership of the Equity Sub-Committee shall include a member from each of Academic Policy, Planning, and Research, and Academic Standards, Curriculum, and Pedagogy.</p>	<p>2 additional other members of Senate Executive (normally including one student)</p> <p>1 Academic Policy, Planning and Research member designated by the Committee</p> <p>1 Academic Standards, Curriculum and Pedagogy member designated by the Committee</p> <p>Vice-President, Equity, People and Culture, ex-officio</p> <p>Secretary of Senate (or designate), <i>ex-officio</i></p> <p>Reporting</p> <p>5.14 The Sub-committee’s reports to Senate Executive will be a standing item on the agenda of Senate Executive Committee, and The Sub-committee is required to will report regularly to inform Senate Executive of on its activities on a regular basis. The Sub-Committee will file its twice annual reports after, including its consultations with other Senate committees on equity-related matters.</p>	<p>equity initiatives. A specific number of Senate Executive, APPRC and ASCP members is also defined for greater clarity, while preserving the intention of keeping the sub-committee to a modest size.</p>
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<p>Appendix C Senate Nominations Rules and Procedures</p> <p>1. SENATE NOMINATIONS RULES AND PROCEDURES</p> <p>1.1. The following are the general procedures and guidelines used by the Senate Executive Committee in the nomination process.</p> <p>Procedures</p> <p>1.2. In developing the slate of nominees for vacant positions, the following actions are taken:</p>	<p>Appendix C Senate Nominations Rules and Procedures</p> <p>SENATE NOMINATIONS RULES AND PROCEDURES</p> <p>1.1 The following are the general procedures and guidelines used by the Senate Executive Committee in the nomination process for membership on Senate committees and other positions elected by Senate.</p> <p>Principles As part of its commitment to equity, diversity and inclusion, Senate aims to constitute a body that is reflective of the diversity of the University community and in our society. Senate explicitly articulates its commitment and desire to enhance institutional equity, diversity and inclusion through its membership in the plenary, its standing committees and other elected positions.</p> <p>Procedures</p> <p>1.2 In developing the slate of nominees for vacant positions, the following actions are taken, each to explicitly include the encouragement of nominations from individuals who self-identify as members of equity-deserving groups²:</p>	<p>Revisions proposed by the Equity Sub-committee to integrate further equity considerations in the Senate nominations process for committee and elected positions.</p> <p>Note: <i>the Equity Sub-committee will confirm the final wording of the revisions prior to the Senate meeting in June.</i></p>
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<ul style="list-style-type: none"> a. call for nominations is issued which lists vacancies and provides information about committees and positions b. Faculty Councils, Deans and Principal are asked for suggestions c. members of the Senate Executive Committee suggest names d. the names of those who have served on Senate Committees in the past are reviewed <p>Elections and Acclamations</p> <p>1.3 Senate Executive shall endeavour to identify sufficient numbers of candidates to construct a slate leading to a vote and encourage Faculty Councils to maximize the number of individuals standing for election to Faculty- designated seats. This is a guiding principle and not a requirement for election processes, which may result in acclamations.</p>	<ul style="list-style-type: none"> a. call for nominations is issued which lists vacancies and provides information about committees and positions b. Faculty Councils, Deans and Principal are asked for suggestions c. members of the Senate Executive Committee suggest names d. the names of those who have served on Senate Committees in the past are reviewed <p>Elections and Acclamations</p> <p>1.3 Senate Executive shall endeavour to:</p> <ul style="list-style-type: none"> a. identify sufficient numbers of candidates to construct a slate leading to a vote and encourage Faculty Councils to maximize the number of individuals standing for election to Faculty-designated seats on relevant Senate committees. This is a guiding principle and not a requirement for election processes, which may result in acclamations. b. identify nominations from diverse candidates from equity-deserving groups 	
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² Includes women, Black, racialized persons and Indigenous Peoples, persons with a disability, and persons who identify in the 2SLGBTQ+ community

<p>Nomination Guidelines and Criteria</p> <p>1.4 The selection of faculty members for nomination to Senate Committees and legislated sub committees will be conducted in such a way as to draw on the various talents of members of all Faculties of the University.</p> <p>1.5 Notwithstanding the suggestions made or the interest shown by individuals, nominees selected for a ballot/acclamation are considered in the context of the following criteria:</p> <ul style="list-style-type: none"> a. the responsibilities of the position and any specific requirements which can be reasonably anticipated in the coming three-year period b. the skills, including leadership skills, which the candidates would bring to the position c. the experience which the candidates would bring to the position d. the current and historical balance among Faculties, in the case of non-designated committees e. the current and historical gender balance f. the range of skills and experience of other continuing members of the committee g. the level of interest of the candidate in the subject matter 	<p>Nomination Guidelines and Criteria</p> <p>1.4 The selection of faculty members for nomination to Senate Committees and legislated sub committees will be conducted in such a way as to draw on the various talents and the diversity of members of all Faculties of the University.</p> <p>1.5 Notwithstanding the suggestions made or the interest shown by individuals, nominees selected for a ballot/acclamation are considered in the context of the following criteria:</p> <ul style="list-style-type: none"> a. the responsibilities of the position and any specific requirements which can be reasonably anticipated in the coming three-year period b. the skills, including leadership skills, which the candidates would bring to the position c. the experience which the candidates would bring to the position d. the current and historical balance among Faculties, in the case of non-designated committees e. the current and historical balance of diversity of members from equity-deserving groups f. the range of skills and experience of other continuing members of the committee g. the level of interest of the candidate in the subject matter 	
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<ul style="list-style-type: none"> h. the availability of the individual to attend meetings and contribute to the work of the committee i. the ability of the individual to participate in the work of the committee through the electronic medium where this is an important and ongoing modality of the Committee <p>1.7 In applying the criteria above, a special effort should be made to include younger and less experienced faculty in the work of committees as a means of developing them for further service in the future.</p> <p>1.8 Leadership ability and relevant experience must be present in those being put forward for senior positions and committees.</p>	<ul style="list-style-type: none"> h. the availability of the individual to attend meetings and contribute to the work of the committee i. the ability of the individual to participate in the work of the committee through the electronic medium where this is an important and ongoing modality of the Committee <p>1.7 In applying the criteria above, a special effort should be made to include junior and less experienced faculty in the work of committees as a means of developing them for further service in the future.</p> <p>1.8 Leadership ability and experience in any relevant context must be present in those being put forward for senior positions and committees.</p>	
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Report to Senate

At its meeting of 26 May 2022

FOR ACTION

Markham

- a. **Establishment of BSc in Financial Technologies • School of Information Technology • Faculty of Liberal Arts & Professional Studies • Markham Campus**

ASCP recommends that,

Senate approve the establishment of a BSc (Honours) program in Financial Technologies, housed in the School of Information Technology, Faculty of Liberal Arts & Professional Studies, and located at Markham Campus, effective FW2024-2025.

Rationale:

As outlined in Appendix A, the BSc (Honours) program in Financial Technologies is proposed in the context of the many technological innovations that have emerged in the finance sector in recent decades, combining computing and information technology training with economics and finance education. The program will be housed in the School of Information Technology until such time that an independent department is needed.

With its exclusive focus on computing and mathematics in relation to financial technologies applications, the program is distinct from offerings at York, such as Computer Science, and at other postsecondary institutions. While a number of credentials specializing in Financial Technologies exist in the Ontario context, the proposed new program will be one of the first comprehensive programs of its kind. As a global finance hub, the Greater Toronto Area is expected to be a major site of innovation within the field of Financial Technologies, providing opportunities for partnerships between the program and employers and a career pathway for graduates.

The curriculum organizes core courses around four groupings – mathematics, computing, financial, and integrative/specialized courses on financial technologies – combining courses that would typically be found in finance and computing or

Academic Standards, Curriculum and Pedagogy Committee Report to Senate

information technology programs, with an emphasis on AI, data analytics, cybersecurity, high-assurance enterprise systems development and distributed systems. While proposed course titles and brief descriptions are outlined in the proposal, courses are to be developed by the incoming faculty members for the program. The program will be technology-enhanced, with blended learning and flipped classrooms to serve as the primary instructional strategies, and have a strong professional orientation, featuring an internship component to be facilitated as part of the campus-wide internship capability expected at Markham Campus. Students also will be exposed to experiential learning through case studies and a fourth-year capstone project.

The program is a natural fit with LA&PS in view of the societal, political, and economic phenomena that both motivate and are impacted by financial technologies, with a companion proposal to authorize the Faculty to house a BSc degree type addressed under item 6b. The degree requirements are aligned with the Senate-approved BSc matrix and will support the achievement of the learning outcomes that have been developed for the program. The external appraisers endorsed the program and their recommendations for enhancements were made by the proponents.

Statements from the Dean of the Schulich, the Vice-Dean of Lassonde and a number of departments within LA&PS confirm consultation on and support for the proposed degree. Statements from the anchor Dean and Provost confirm the resources for the new program.

Approvals: LA&PS Faculty Council 14 April 2022 • ASCP 13 April 2022 • APPRC 19 May 2022

b. Authorization to house a BSc degree type in the Faculty of Liberal Arts & Professional Studies

ASCP recommends that,

Senate authorize the housing of a BSc degree type in the Faculty of Liberal Arts & Professional Studies effective FW2024-2025, contingent upon approval of the establishment of the BSc (Honours) program in Financial Technologies.

Rationale:

Academic Standards, Curriculum and Pedagogy Committee Report to Senate

As the BSc (Honours) program in Financial Technologies will be the first Bachelor of Science program to be housed in LA&PS, an additional element of its establishment is the authorization of the housing of a BSc degree type within the Faculty. The BSc degree framework within LA&PS has been approved by the requisite Faculty governance bodies, including Faculty Council. As outlined in Appendix B, the BSc degree would be in addition to the five other undergraduate degree types offered by the Faculty (Bachelor of Arts, Bachelor of Commerce, Bachelor of Human Resource Management, Bachelor of Social Work, and Bachelor of Disaster and Emergency Management). The supporting documentation in Appendices A and B provides clear evidence that a BSc is the appropriate degree framework for the Financial Technologies program given the computer science and mathematical elements of the curriculum and the expectations of graduate programs, students, faculty and employers in this sphere. It is not anticipated that additional BSc degree programs will proliferate within LA&PS in the future.

Approvals: LA&PS Faculty Council 10 March 2022 • ASCP 19 April 2022 • APPRC 19 May 2022

New Program

c. Establishment of BSc (Honours) and BA (Honours) programs in Data Science • Department of Mathematics and Statistics • Faculty of Science

ASCP recommends that,

Senate approve the establishment of BSc (Honours) and BA (Honours) programs in Data Science, housed within the Department of Mathematics and Statistics, Faculty of Science, effective FW2023-2024.

Rationale:

The documentation as set out in Appendix C describes a proposal for new BSc (Honours) and BA (Honours) programs in Data Science, a growing field that uses computing and mathematical and statistical reasoning to extract knowledge and insights from data. In this program, each student will master the statistical methods, computation skills and data techniques that enable data scientists to extract knowledge from data. Each student will become familiar with the nature and needs of analyzing large and complex data, and with case studies specific to a particular domain such as

Academic Standards, Curriculum and Pedagogy Committee Report to Senate

business, health, biology, or psychology, through a capstone experience that engages students in research with data in an industrial setting.

The program will provide students with a specialized education in data science with which they can leverage emerging data science technologies for the generation of insights and solutions to challenges organizations face in rapidly changing business and policy environments. Students will learn both the theoretical and applied perspectives of data science technologies and become knowledgeable in their stream subject. Students will be effective communicators, able to effectively participate with others in data science projects and conscious of the ethical and social responsibilities of data science.

The program requirements were developed to meet the pan-University and Faculty of Science requirements for BA and BSc Honours degrees and designed by a task force in the Department of Mathematics and Statistics that included input from the Department of Electrical Engineering and Computer Science in Lassonde, and the School of Information Technology, the Department of Philosophy and the Writing Department in LA&PS. Additional consultations were undertaken with external stakeholders including directors of other Data Science programs from other universities in Canada and the United States.

The proposal includes statements of support from the relevant departments and administrative units that confirm consultation on and support for the proposed degrees. Statements from the Dean of the Faculty of Science and the Provost confirm the resources for the new program.

Approvals: Science Faculty Council 8 February 2022 • ASCP 16 March 2022 • APPRC 5 May 2022

Major Modification

- d. Addition of Type 1 and 2 Options for the Graduate Diploma in Management • School of Administrative Studies • Faculty of Liberal Arts & Professional Studies • Markham Campus**

ASCP recommends that,

Academic Standards, Curriculum and Pedagogy Committee Report to Senate

Senate approve the addition of Type 1 and 2 options for the Graduate Diploma in Management, housed in the School of Administrative Studies, Faculty of Liberal Arts & Professional Studies, and located at Markham Campus, effective FW2023-2024.

Rationale:

The documentation is set out in Appendix D in the form of a proposal to create Type 1 and 2 Options for the Graduate Diploma in Management. The Diploma is currently offered as a Type 3, or standalone, option, intended as a pathway to the Master's of Science in Management Practice for students who do not have a background in business or management.

As the Master of Biotechnology Management, approved by Senate on 24 March 2022, is a Combined Degree Program¹ with the Graduate Diploma in Management, it is necessary for the Type 2 option to be established, thereby enabling the Diploma to be taken in conjunction with the Master's program. This combined program will enable students to develop management skills and biotechnology knowledge simultaneously, with the two disciplines to be integrated in a capstone project. There will be no changes to the Diploma requirements or learning outcomes.

The Type 1 option of the Diploma will be awarded to Master's candidates who leave a program after completing a specific proportion of the requirements.

Approvals: LA&PS Faculty Council 10 March 2022 • ASCP 27 April 2022

¹ A program of study involving two programs of different types in which successful completion of the requirements is confirmed by a separate and different degree document being awarded by each program. The combination may comprise two graduate programs, two undergraduate programs or a graduate and an undergraduate program. For Combined Degree Programs that involve a graduate program, the combination typically involves at least one "professionally" oriented program. Combined Degree Programs may be structured such that students pursue the two programs concurrently or consecutively.

Academic Standards, Curriculum and Pedagogy Committee Report to Senate

Policy Item

e. Revisions to the Senate Policy on Sessional Dates and the Scheduling of Examinations

ASCP recommends that,

Senate approve revisions to the *Senate Policy on Sessional Dates and the Scheduling of Examinations*, as set out in Appendix E, effective FW2022-2023.

Rationale:

As the last Senate review of the *Policy on Sessional Dates and the Scheduling of Examinations* occurred four years ago, the University Registrar surfaced proposed revisions to ASCP for consideration to maintain the Policy's currency. Having been approved by ASCP, the revisions are now before Senate, set out in Appendix E.

The changes primarily seek to enhance clarity and consistency in the Policy, with the substantive change being the shift in the counting of sessional dates from weeks (12) to days (60-63). While the 12-week teaching term has been a central feature of the Policy since 2008, previous iterations described terms in days; in fact, the term length was set at a minimum of 59 days until 2008. In addition, as the "12-week teaching term" currently represents the only reference to weeks in the Policy, the shift to days brings greater consistency in the language. A term of 60-63 weekdays will typically be equivalent to 12 weeks.

In response to questions and suggestions made at the 28 April 2022 Senate meeting, additional refinements have been incorporated into the proposed revisions to further enhance clarity. The primary adjustment was to use the term "weekday" instead of "day" to describe the term length. Revisions originally proposed to Senate in April are denoted in **bold red font** with subsequent adjustments denoted in **bold blue font**.

No changes are required to the sessional dates for FW2022-2023, FW2023-2024 and SU2024, which were previously confirmed by ASCP and reported to Senate, as they are aligned with the policy revisions.

Approvals: ASCP 13 April 2022 and 11 May 2022

Academic Standards, Curriculum and Pedagogy Committee Report to Senate

For Information

a. Minor Modifications

ASCP approved the following minor changes effective FW2023-2024 unless otherwise indicated.

Glendon (effective FW2022-2023)

Degree requirements for the Specialized Honours BA and iBA programs in International Studies

Degree requirements for the Specialized Honours BA, Honours BA and iBA in Political Science

Admission requirements for the Master's in Public and International Affairs

Schulich

Admission requirements for the Master of Accounting and Diploma in Accounting programs

b. Minor Corrections to Degree Requirements

Minor corrections to degree requirements for previously approved program modifications were reported to ASCP, effective FW2022-2023.

Environmental and Urban Change

Dual Credential Program in Ecosystem Management at Fleming College and the BES Honours Major in Sustainable Environmental Management

Glendon

BA programs in Political Science and History

N. Richardson, Chair

YORK UNIVERSITY

New Undergraduate and Graduate Degree Program Proposal Template

The development of new undergraduate and graduate degree programs follows the protocol for new degree approvals as outlined in the York University Quality Assurance Process and complies with the Quality Council's Quality Assurance Framework.

The Program Brief for new degree programs that require full approval includes two components for undergraduate programs and three components for graduate programs, as follows:

- program proposal, including letters of consultation/support and other relevant appendices
- curricula vitae of the faculty, including, for graduate programs, program-specific appointment criteria

To ensure that all evaluation criteria are addressed in the proposal under development, program proponents are required to submit the New Program Brief in the following format.

Note: additional criteria for Joint Degree Programs or Dual Credentials, comprised of wholly new programs are listed at the end of this document.

York University

New Program Proposal

of the

**Honours Bachelor of Science
in Financial Technologies**

Note: Additional documentation available upon request.

1. Introduction

1.1. Brief Statement

Provide a brief statement of the degree program(s) being proposed, including commentary on the appropriateness and consistency of the degree designation(s) and program name with current usage in the discipline or area of study.

This is a proposal to establish a 120-credit Bachelor of Science (BSc) in Financial Technologies for York University, Markham. The term “Financial Technologies” or “FinTech,” is broadly used today to describe a wide variety of technological innovations emerging in the finance sector over the past decades. Drawing on this growing field, this program will combine computing and information technology training with economics and finance education to prepare graduates for a career in technology-intensive roles within financial institutions as well as service providers and technology developers within the financial sector.

Given that the program is highly technical in nature, with an aim at developing strong programming and mathematical skills, the designation of Bachelor of Science (BSc) is deemed appropriate. The program consists of four major groups of courses: mathematics, computing, finance and integrative/specialized courses on financial technologies. The program is distinct from a computer science (CS) program in that it focuses exclusively on computing and mathematics courses that specifically target Financial Technologies applications, it includes a substantial number of finance and economics courses, and offers integrative and specialized FinTech courses that require finance background.

The program is being proposed by and housed within the School of Information Technology until the need or opportunity emerges to propose a new academic unit, e.g., the School of Financial Technologies, to govern and administer the program. A potential proposal to establish a new academic unit will come forward under separate cover and will follow York University policy and procedure pertaining to the creation of new academic units. Likewise, the program intends to use the course rubric FINT for the core and major courses it originates to serve the Financial Technologies program. The proposal to establish the new rubric will also come forward under separate cover and according to policy and procedure pertaining to the creation of novel course rubrics.

1.2. Proposal Development

Provide a brief description of the method used of the development and preparation of the New Program Brief, including faculty and student input and involvement.

From the fall of 2020 through to the summer 2021, extensive consultation from experts from five (5) different departments within York was sought for the development of this program including experts from the School of Administrative Studies, Economics, Mathematics, Information Technology, Computer

Science and Schulich. An iterative approach was followed whereby the initial curriculum was refined and abstracted to meet recommendations and pragmatic constraints.

Related literature as well information posted by professional associations and organizations related to finance and financial technologies were consulted to understand market trends and future outlook of the industry and inform the learning outcomes of the proposed program.

Consultations with industry are planned during the course and internship development stages of the program.

1.3. Home Faculty

Indicate the Faculty/unit in which the program will be housed.

The program will be housed in the Faculty of Liberal Arts and Professional Studies, at first within the School of Information Technology and, when the need emerges, within a new unit. This new unit can grow in a way that it can offer a variety of different future majors and minors whose central focus is the application of information and computational technologies to the study of financial and economic phenomena, such as, computational economics or financial engineering.

1.4. Location

Indicate the location/campus of the new program.

The program will be located at the Markham Campus.

2. General Objectives of the Program

2.1. Brief Description

Provide a brief description of the general objectives of the program.

The program aims to prepare students for a technology-related career in the financial sector. Graduates will have a strong grasp of information and computational technologies that are relevant to the financial domain as well as a strong familiarity with financial concepts. Combined, these knowledges and skills will allow graduates to understand the context and objectives of the technologies they will be able to build for and with the financial sector.

The curriculum combines courses that can be found in a computing or information technology program, with an emphasis on AI, data analytics, cybersecurity, high-assurance enterprise systems development and distributed systems, with courses found in Finance BA/BSc. The program will have a strong professional orientation and will feature an internship component. The program will also be part-time student friendly, targeting both local first-degree students and professionals in the Markham area interested in entering the Financial Technology field.

Learning in the program will be strongly technology-enhanced and promoting blended learning, experiential hands-on and flipped classroom as the principal instructional strategies.

2.2. Objectives vis-à-vis University and Faculty missions and academic plans.

Describe how the general objectives of the program align with University and Faculty missions and academic plans.

The program supports [UAP 20-25](#) as follows:

- The program is highly innovative (Priority 1 / Objective 2) as few comparative programs exist in Ontario [see also section 3.1].
- It demonstrates true and meaningfully interdisciplinary education given that it draws from Mathematics, Finance, Business and Information Technology (Priority 1 / Objective 2 and 4)
- It is EE-enabled through its internship component (Priority 3 / Objective 1, Priority 6 / Objective 1) and other EE learning strategies that are enhanced through technology (Priority 3 / Objective 2).
- Topics taught in the program very strongly relate to the UN's Sustainable Development Goals, including climate and environmental sustainability (#13), poverty (#1), economic growth (#8), and reduced inequalities (#10). Graduates will have the technical proficiency to appreciate how and when proposed financial technology applications enhance or impede fulfillment of such goals. This way, the program paves the way for future programs and streams strongly focusing on the impact of financial technologies in economies and societies.

Despite its technical orientation, the program is a natural part of the Faculty of Liberal Arts and Professional Studies, considering the societal, political, and economic phenomena that both motivate and are impacted by Financial Technologies. The program supports the principles of the [Faculty of Liberal Arts & Professional Studies Academic Plan, 2021-26](#) as follows:

- The program engages in a sustained effort to enhance the academic experience of LA&PS students to build up students' skills in critical thinking, effective communication, digital fluencies, information literacies, and evidence-based scholarly inquiry [Principle 1a].
- By being offered at the Markham Campus, the program promotes collaborations with York Region (including Markham) to make a positive local impact on the communities LA&PS serves [Principle 2c].
- The program's hiring plan includes the recruitment of several full-time faculty members to join the existing in the demonstration of strong research agendas in areas that are relevant to the Financial Technologies learning outcomes. By advancing their research agendas in LA&PS, they will "promote research, knowledge mobilization, and dissemination that responds to emerging issues and changing needs in society, including opportunities to collaborate with community, industry, government, and other public and private partners" [Principle 3c].
- By creating an internship and other experiential learning opportunities for students in the program, Financial Technologies promotes and supports curricular and pedagogical innovation

across all units with particular attention to experiential learning opportunities for students in all programs [Principle 4b].

- A broad educational offering on Financial Technologies includes a study of how such technologies impact societies, economies and the environment. A fundamental understanding of such impacts is part of the program's outcomes (LO6) and the offered content. Future "sister" programs or streams with a stronger social sciences orientation can draw the necessary technical foundation (e.g., introductory, practical, or survey courses) from the capabilities and resources developed within this program. The program's embedding into LA&PS is, therefore, highly advantageous in that it allows for easier maintenance of connections with economics, social sciences, politics, public policy and management, which all constitute focal points of such future program expansions. See also Section 4.1.

The program supports the objectives of [SMA3](#) as follows:

- The program targets sizable and rich sector of the Toronto economy (see above). Cutting edge technology training offered through the program (AI, cybersecurity, blockchain) allows for alternative careers in tech outside financial domain [Metrics: *Graduate Employment Rates (#1) and Earnings (#9)*]
- The program features a strong experiential education (EE) component through case studies, the capstone project and the internship [Metric: *Experiential Learning (#7)*].

The program also aligns with the core Markham theme of "*technology [...] as applied in different contexts and professional fields*" by meeting the need for innovative, job-ready, and technology intensive content and skills that will meet the demands of the 21st century.

2.3. Degree Nomenclature

Describe the appropriateness of the degree nomenclature. Note: Degree types are approved by Senate and require two meetings for approval: an initial notice of motion and then the motion to establish the new degree type.

The proposed program has sufficiently strong focus on technical and mathematical education to fit under the Bachelor of Science category. Furthermore, the curricular structure meets the Bachelor of Science requirements as set by York University including general education (30 credits including the 27 credits as stipulated by the [BSc Matrix](#) legislation), science credits outside major (24 credits) and upper-level requirements.

No new degree type is proposed.

3. Need and Demand

3.1. Similar Programs

Identify similar programs offered at York and/or by other Ontario universities, with special attention paid to any innovative and distinguishing aspects of the proposed program.

Financial technology is a rapidly expanding industry. Because of this, it is also a rapidly growing field for education. In Ontario, there are relevant *credentials* available to post-secondary students at a number of institutions as well as *aspects* of programs related to FinTech; but there are no specific programs devoted to Financial Technologies. The credentials and programs available across Ontario include:

- Certificate: Fintech Boot Camp (part-time, 24 weeks, online only), University of Toronto Continuing Studies, Toronto
- Certificate: Financial Technology Essentials (part-time, online), Lambton College, Toronto
- Ontario College Graduate Certificate (2 semesters, part-time or full-time, blended), Seneca College, Toronto
- Ontario College Graduate Certificate: (2 semesters), Loyalist College, Belleville
- Bachelor of Computing and Financial Management: (co-op), University of Waterloo, Kitchener-Waterloo
- Master of Financial Innovation and Technology: Queen’s University, Kingston
- Master of Finance (MFin) (which includes a FinTech component): Rotman School of Management, University of Toronto

A number of Ontario Colleges (such as Centennial) also offer introductory courses in financial technologies but do not offer a credential. While some American universities, such as Cornell University, offer undergraduate degrees in financial technologies, these are only available to complete fully online.

An environmental scan shows that there are still relatively few options for prospective students to earn a university undergraduate degree in this field in Canada, especially on a new and innovative campus such as the Markham campus; therefore, there is little existing competition for York and the field is open for a new and innovative degree program.

Currently, the only university competitor at the undergraduate level is Waterloo. Compared, the proposed program has a relatively stronger technical and mathematical orientation and a focus on financial technologies with several purpose-built courses and EE opportunities. Nevertheless, the Waterloo program is indicative of the level of demand for education in the FinTech domain. That program screens its applicants on the basis of participation in math competitions such as the Canadian Senior Mathematics Contest. To be considered for financial aid from one of the departments which hosts the degree, students are required to participate in one of these contests. These additional criteria suggest that there is unmet demand for this program. For example, students who may be strong in math but did not compete in any of these contests because of, e.g., demanding work schedules, would still be welcome in the proposed program.

Finally, there are also a number of non-degree credentials in southern Ontario, such as the Ontario College Graduate Certificates at Seneca and Loyalist, which create a pathway from college for students who want to earn a degree. On the other hand, graduate programs in financial technologies are also emerging—for example, the Master of Financial Innovation and Technology to be offered at Queen’s

starting in fall 2021—which means that students who graduate from York University with a degree in financial technologies will also be well situated to pursue advanced degrees in this field if they choose.

In summary, the proposed program will be one of the first comprehensive FinTech programs in Ontario, offering a BSc option, a cohesive purpose-made set of courses and strong EE opportunities. With these advantages in mind combined with its strategic location, the program can be expected to attract substantial interest from qualified students from within and outside the GTA.

3.2 Description and Need

Provide brief description of the need and demand for the proposed program, focusing as appropriate on student interest, social need, potential employment opportunities for graduates, and/or needs expressed by professional associations, government agencies or policy bodies.

Major professional associations in the financial domain indicate in various ways the importance of financial technologies in the sector. The CFA (Chartered Financial Analysts) Institute for example¹ recognizes the current and future impact of financial technologies in the asset management industry and has consequently included topics such as AI, machine learning, algorithmic trading, data science, blockchain, and robo-advising in its CFA Program curriculum.

The Canadian Bankers Association (CBA) also characterize FinTech as a tremendous opportunity for Canada's financial industry,² listing a wealth of IT projects Canadian banks engage in, including AI, payments, planning tools, security strategies, mobile and digital ID, that could use professionals with the knowledge of economics and the skill in technological design. CBA lists Canadian banks as incubators for innovation in the area.

Meanwhile, Payments Canada³ promotes a program for payments and settlement modernization through such initiatives as the Real-Time Rail (for real-time payments with finality and irrevocability), and Lynx (a high-value payments system). Moreover, a sizeable ecosystem of start-ups, often sponsored by or partnering with established institutions is also emerging.

The above indicate that the on-going and future technology development projects undertaken by financial institutions and start-ups alike will require a substantial workforce and innovative leaders who are not only technologically qualified but also has a broad understanding of the financial domain. This is interpreted to an ability to not only translate across the two domains (technological and financial), but also independently innovate in the intersection of the domains.

¹ Chartered Financial Analysts (CFA) Institute. <https://www.cfainstitute.org/en/research/fintech>

² Canadian Bankers Association. <https://cba.ca/technology-innovation-banking>

³ Payments Canada. <https://www.payments.ca/>

This will be especially important for students in and around the GTA, such as our Markham students, as the GTA is one of the central stages where innovation in FinTech can be expected to take place globally. For example:

- According to the Toronto Finance International (TFI), Toronto is the largest financial center in North America and the third largest globally after Luxemburg and Singapore, in terms of financial services employment.⁴ Based on bankers' annual rankings of international finance, both TFI and Investment Canada consider Toronto to be North America's second-largest financial hub behind New York.⁵ Further, the financial services sector is the largest private sector contributor to Toronto's GDP, the second largest in Ontario, and the third largest in Canada.⁶
- According to Statistics Canada, more than 11% of salaried workforce in Ontario is employed within the Finance and Insurance domain,⁷ three quarters of which is in Toronto.⁸ More than 37% of Canada's Finance and Insurance jobs are in Toronto.
- Investment in financial technology innovation has been substantial over the last three years. According to KPMG, for example, a total of \$2.9B was invested in the FinTech sector in Canada in 2019.⁹
- Invest Ontario reports over 600 FinTech firms, 12,000 financial services firms, and nearly 380,000 financial services professionals located across Ontario.¹⁰

The above evidence suggests that job opportunities in the financial sector in the GTA are substantial and a good part of these positions are technology-intensive. The evidence also points to the ample space for partnerships between York and employers for the mutual benefit of students and the industry, thus paving the way for deeper research-based academia-industry engagement and student experience. These factors are bound to attract highly qualified students who can both count on relevant industry-informed education and a smooth transition to a successful career thereafter, and ensure a rich career upon graduation.

While the ideal career for the graduates of the proposed program is the financial industry, its graduates would have sufficient computing skills to also be employed in the wider IT sector, which is also in substantial need for talent. For example, according to an ICTC¹¹ report, a total of 216,000 new ICT jobs across Canada were predicted in 2021 alone, 88,000 of which are projected for Ontario.

4. Program Curriculum

⁴ Toronto Finance International. <https://tfi.ca/policy-research/the-impact-of-torontos-financial-sector>

⁵ Invest Ontario. Financial Services. <https://www.investontario.ca/financial-services>

⁶ Toronto Finance International. <https://tfi.ca/policy-research/the-impact-of-torontos-financial-sector>

⁷ Statistics Canada. Employment by industry, annual. <https://doi.org/10.25318/1410020201-eng>

⁸ City of Toronto. Industry Sector Support: Financial Services. <https://www.toronto.ca/business-economy/industry-sector-support/financial-services/>

⁹ KPMG. Pulse of FintechH2 2019. <https://assets.kpmg/content/dam/kpmg/xx/pdf/2020/02/pulse-of-fintech-h2-2019.pdf>

¹⁰ Invest Ontario. Spotlights: 12 Fintech companies to watch in 2021. <https://www.investontario.ca/spotlights/fintech-flourishes-ontario>

¹¹ ICTC. The next talent wave: Navigating the Digital Shift – Outlook 2021. https://www.ictc-ctic.ca/wp-content/uploads/2017/07/ICTC_Outlook-2021-ENG-Final.pdf

4.1 Program Requirements and unique curriculum and program innovations

Describe the program requirements and the ways in which the curriculum addresses the current state of the discipline or area of study. Identify any unique curriculum or program innovations or creative components.

The proposed program combines:

- A set of core technology courses for building competence in software development and data analytics / AI.
- A set of mathematics courses for developing skills necessary for comprehending advanced concepts in finance and machine learning.
- A set of accounting, finance, and economics courses for developing understanding of financial phenomena, tools and instruments.
- A set of integrative courses that integrate technology with finance to (a) show how computing and information technologies can be applied to the financial domain (b) invite students to devise novel and innovating technological solutions to problems within the financial domain, and (c) critically explore financial technologies and their impact to society, including social justice, inclusion and diversity, and environmental sustainability.

These courses will be organized progressively so that students develop their technological skills, to which economic, accounting, and financial theory will be added, and then introduced to a series of integrative experiences that combine these fields.

Table 1. Program Overview

	Technology	Mathematics	Economics, Accounting & Finance	Fintech Integrative & Entrepreneurship
1 st yr.	- Introduction to Programming (Coding through Mechatronics)	- Applied Calculus I & II- Statistics	- Microeconomics - Macroeconomics	
2 nd yr.	- Object-Oriented Programming - Data Structures	- Elementary Probability - Introduction to Statistics II	- Financial Accounting - Theory of Interest - Models of Financial Economics	- Introduction to Financial Technologies
3 rd yr.	- Networks & Distributed Systems - Computer and Network Security - Machine Learning for Finance - Data and Knowledge Management Electives: - Web and Mobile Programming - Introduction to Cloud Com. - Network Security		- Quantitative Finance - Financial Intermediation and Banking	- Cases in Financial Technologies
4 th yr.	- Engineering Financial Software - Software Quality Assurance Electives: - Advanced Topics in Machine Learning		- Financial Decision Making - Investment Management - Capital Markets and Trading	- Financial Cryptography and Blockchain - Payment Systems and Cryptocurrencies - Capstone Project - Technical Entrepreneurship

The program includes 30 credits of foundations, including 15 credits non-science GenEds, 6 science labs, 6 mathematics and 1 computing requirement, in compliance with York’s BSc Matrix and the LA&PS general education requirements. The required core credits are 69 plus 12 credits chosen from a list. An additional 9 credits are dedicated for electives outside of major. The high-level credits structure can be viewed in Table 2 while the complete course map can be viewed in Table 3.

Table 2. Credits Overview

	Code	Description	Credits
Foundations	GenEd	General Education	21
	M	Mathematics/Computation	9
	CORE	Core Courses	69
	E	Electives within Major (from list)	12
	O	Free Choices Outside Major	9
Total:			120

Table 3. Course Overview by Offering Unit (see Table 2 for course categories and credit totals)

Financial Technologies

	Fall	Cr.	Choice	Winter	Cr.	
Year 1	GenEd	Gen. Ed. ...	Choice	GenEd	Gen. Ed. ...	
		Science Lab ...			Science Lab ...	6
	M	Applied Calculus I MATH1013		M	Applied Calculus II MATH1014	3
		Introduction to Computer Programming for Financial Techn FINT1210			Introduction to Statistics I MATH1131	6
Year 2	CC	Introduction to Microeconomics ECON1000		CORE	Introduction to Macroeconomics ECON1010	
	Ge	Gen. Ed. ...		GenEd	Gen. Ed. ...	
		Elementary Probability MATH2030			Gen. Ed. ...	6
	CORE	Object-Oriented Programming for Financial Technologies FINT2210		CORE	Models of Financial Economics MATH2281	9
Year 3		Financial Accounting ADMS2500			Financial Services and Technologies FINT2010	
		Theory of Interest (Fixed Income) MATH2280			Data Structures ITEC2622	
	CORE	Finance ADMS3530		CORE	Intro to Security Threats CSSD2221	
		Quantitative Finance MATH3285			Cases in Financial Technologies FINT3010	
Year 4		Networks and Distributed Systems FINT3410			Financial Intermediation and Risk Management in Banking FINT3620	
		Data and Knowledge Management FINT3310			Machine Learning for Finance FINT3320	
	E	ELECTIVE ...		E	ELECTIVE ...	
	O	OUTSIDE MAJOR ...		O	OUTSIDE MAJOR ...	
Year 4	CORE	Quantitative Analysis for Financial Decision Making FINT4610		CORE	Capstone Project in FinTech FINT4000	
		Engineering Financial Software FINT4220			Financial Cryptography and Blockchain FINT4730	
		Payment Systems and Cryptocurrencies FINT4720			Software Quality Assurance FINT4230	
	E	ELECTIVE ...		E	ELECTIVE ...	
	OUTSIDE MAJOR ...			OUTSIDE MAJOR ...		
ELECTIVES		Advanced Topics in Machine Learning FINT4350				
		Data Visualization ITEC3310				
		Network Security CSSD3221				
		Introduction to Cloud Computing CSSD2211				
		Web and Mobile Programming CSSD3xxx				
		Technology Entrepreneurship ENTP4945				
		Investment Management FINT4630				
	Capital Markets and Trading FINT4620					
Unit Coding						
Mathematics						
Admin Studies						
Information Technology						
Economics						
Computer Science and Electrical Engineering						
Financial Technologies (ITEC)						

The knowledge, skills, and experience that needs to be acquired during the course of study in the proposed program is substantial. Therefore, we have developed a schedule of recommended courses,

by term, that will aid students in their progression through the major. As a student progresses in the program, they will be able to choose certain courses, and the order of courses, that best serve their interest and skill. Note that we hope to expand and develop these choices as the program grows. Further, these Markham students will also be encouraged to take courses that will be part of the shared Markham curriculum (the outside the major courses) for greater growth and well-roundedness for future endeavors.

As seen in map of Table 3:

- The core technology component is offered by a number of course to be developed by the School of Information Technology (ITEC) under the proposed "FINT" rubric and the Department of Computer Science and Engineering (EECS) under the rubric of the proposed Computer Science for Software Development at Markham ("CSSD") program.
- The mathematics component is offered by service courses from the Department of Mathematics.
- With regards to the finance component, to honor its overall technical orientation as a BSc and capitalize on the deep mathematical background of the first years, the program is designed to emphasize on mathematical aspects of finance, through courses such as *Models of Financial Economics* and *Quantitative Finance*. Hence the Department of Mathematics is offering the foundation with additional courses with a more practical and information-technology based orientation added on top, such as *Financial Intermediation and Banking*, *Financial Decision Making* and *Investment Management*. Nevertheless, for students who prefer a more applied and less mathematical approach to finance, the corresponding course of the School of Administrative Studies is offered (*Finance*) as an alternative to the Mathematics offering (*Quantitative Finance*). We note that despite the rich Finance component of this program, it is not intended to prepare students for the CFA (Chartered Financial Analysts) examination.
- The program is consciously designed to leave ample space for extensions and parallel offerings on the same general area of Financial Technologies but with a different orientation. Its placement within LA&PS is highly advantageous for building and maintaining a spectrum of offerings. For example:
 - A much less technical and more applied and management- and entrepreneurship-oriented FinTech-related program, also with a practical approach to its finance courses (e.g. the ADMS offerings), can be envisioned in the form of a future BCom stream for Keele or Markham.
 - A BA minor/stream or certificate exclusively studying the societal, economic, policy, and cultural impact of Financial Technologies can be initiated by Social Science, Politics, Public Policy and Administration, Science and Technology Studies or Economics.

Such future initiatives, taken by colleagues and LA&PS departments with the corresponding expertise, would complement the present BSc proposal, offering a wider spectrum of choices and perspectives and consolidating York's leadership in the area.

- Such future offerings could allow partial access to the students of this BSc proposal, in a fashion similar to the one adopted for accessing courses in the proposed BCom in Entrepreneurship and Innovation and the streams of Bachelor of Applied Science in Computer Science for Software Development. The embedding of this BSc in LA&PS will make such integrations easier to coordinate and maintain.

Electives and Non-Major Credits - Recommendations

As seen in Table 3, in addition to a set of core required credits, students of the program select 12.0 credits from a list of *electives* (light grey in the Table) and 9.0 credits as free choices outside of the major (*non-major credits* – dark grey in the Table). While students are free to make the choices they want with those credits, we propose three specific coherent *pathways* that allow them to explore an additional area or deepen one of the areas already served by the program. Students can specifically use combinations of electives and non-major credits to incorporate more *Entrepreneurship*, *Cloud Computing*, and *Cybersecurity* education in their studies, through taking more Administrative Studies and Computer Science courses. We provide details below.

Entrepreneurship

The proposed program can integrate with the Bachelor of Commerce in Entrepreneurship and Innovation, proposed for the Markham campus in parallel to this program. One of the courses proposed for that program, *ENTP4945 – Technical Entrepreneurship*, is already present as an elective in this proposal (Table 3). Before taking this elective, students must use 6.0 out of their 9.0 non-major credits to take the following prerequisites of *ENTP4945*:

ENTP2920 – Innovation and Creativity

ADMS3920 – New Venture and Small Business Management

FinTech students strongly interested in entrepreneurship can dedicate the remaining 3.0 non-major credits to any of the following courses in the program:

ENTP3990 – Hackathon I

ENTP3950 – Social entrepreneurship

ENTP3995 – Independent study in entrepreneurship

ENTP4960 – Principles of entrepreneurship: field project

ENTP4599 – Entrepreneurial Finance

Cloud Computing

The proposed program can also more deeply integrate with the Bachelor of Applied Science in Computer Science proposed for the Markham campus in parallel to this program.

By taking *CSSD2221* as elective, students fulfill the prerequisite to study cloud computing more deeply by dedicating their non-major credits for taking any or all of:

CSSD3111 – Fundamentals of Cloud Systems

CSSD2111 – Software Development for Cloud Computing
 CSSD4211 – Orchestration and DevOps for Cloud Computing

Cybersecurity

By taking CSSD3221 – Network Security as elective, students fulfill the prerequisite to study cybersecurity more deeply by dedicating 6.0 of their non-major credits for taking any or both:

CSSD3121 – Information Systems Forensics

CSSD4221 – Vulnerability Detection

4.2. List of Courses

Provide a list of courses that will be offered in support of the program. The list of courses must indicate the unit responsible for offering the course (including cross-lists and integrations, as appropriate), the course number, the credit value, the short course description, and whether or not it is an existing or new course. For existing courses, the frequency of offering should be noted. For new courses, full course proposals are required and should be included in the proposal as an appendix. (The list of courses may be organized to reflect the manner in which the courses count towards the program requirements, as appropriate; e.g. required versus optional; required from a list of specified courses; specific to certain concentrations, streams or fields within the program, etc.)

Code	Title	Rubric	Cr	Description	Status
ADMS2500	Financial Accounting	ADMS	3	An overview of the accounting discipline, useful to both majors and non-majors. Includes accounting history, the uses of accounting information in personal and business contexts and the rudiments of financial reporting.	Req
ADMS3530	Finance	ADMS	3	The role of financial managers in accomplishing organizational objectives, uses of financial statements, present value theory, risk/return analysis, leverage, cost of capital, resource allocation models.	Opt/Elect
CSSD2211	Introduction to Cloud Computing	EECS	3	CSSD2211 introduces the fundamental concepts of cloud computing. Topics include the motivation of cloud computing, the benefits and risks of cloud computing compared to the traditional on-premises paradigm, cloud service models, virtualization of computing, storage and network, virtual machines vs containers, and architectures for cloud-based services. Students work on projects where they create and manage virtual machines and container clusters using existing cloud computing services (e.g., AWS and Azure). Students are familiarized with the concept	Opt/Elect

				and practice of Software-Defined Environment. The course prerequisite is CSSD2101 (advanced programming), and students could elect it from term four in the program.	
CSSD2221	Intro to Security Threats	EECS	3	CSSD2221 is a placeholder for the first course in the Cybersecurity stream. Its prerequisite is CSSD2101 (advanced programming), and students could elect it from term four in the program. This course will be defined and developed by prospective faculty members who will be hired for the CSSD program and are subject matter experts in Cybersecurity.	Req
CSSD3221	Network Security	EECS	3	CSSD3221 is a placeholder for the third course in the Cybersecurity stream. Its prerequisite is CSSD2221 (Intro to Security) and students could elect it from term six in the program. This course will be defined and developed by prospective faculty members who will be hired for the CSSD program and are subject matter experts in Cybersecurity.	Opt/Elect
CSSD3xxx	Web and Mobile Programming	EECS	3	Introduction to technologies for programming web and mobile applications. Languages and frameworks of focus include HTML/CSS, JavaScript and associated frameworks and introductory Java EE technologies. Modern mobile device features and architecture is discussed and reliability, scalability, security and user interface aspects are emphasized.	Opt/Elect
ECON1000	Introduction to Microeconomics	ECON	3	Introduces the principles and methods of economics with emphasis on microeconomic theory. Topics include general and basic concepts of demand and supply, utility analysis and demand, production and costs, pricing in competitive and monopolistic markets, and government regulation.	Req
ECON1010	Introduction to Macroeconomics	ECON	3	Introduces the principles and methods of economics with emphasis on macroeconomic theory. Topics include basic models of national income and employment determination, fiscal policy, banking and monetary policy, the theory of international trade and finance, and contemporary macro-economic issues such as unemployment, inflation, and government budget policy.	Req

ENTP4945	Technology Entrepreneurship	ADMS	3	This course explores the role of technology in entrepreneurship from two perspectives. First, students will evaluate certain emerging technologies and consider how they might impact product development, operations, and competitive positioning. Second, it will provide hands-on exposure to starting a technology venture by way of an engaging simulation exercise that allows teams to compete while establishing strategies to overcome the uncertainty and complexity associated with new technology venture. Students will interact with 'real-life' technology entrepreneurs and with members of entrepreneurial ecosystems who support the development of technology ventures.	Opt/Elect
FINT1210	Introduction to Computer Programming for Financial Technologies	FINT	3	An introduction to problem solving, task decomposition, and algorithm development in the context of object-oriented and structured programming techniques. Taught in Java, topics include primitive data types, control structures, simple classes, strings and arrays. The course also introduces object-oriented design and the use of API's to develop applications from existing classes.	Req
FINT2010	Financial Services and Technologies	FINT	3	Offers a broad non-technical introduction to the financial sector with an emphasis on how technologies are used to support financial services. Topics include banking and related services (cash management, lending, mortgages and debt collection, payments and money transfers, trading and finance services, advising), treasury and forex, financial markets (capital markets, exchange and execution, intermediaries, algorithmic trading), insurance as well as cross-cutting concerns including customer relationship management, security, risk management and regulatory compliance. Example textbook: Randal Duran. Financial Services Technology: Processes, Architecture, and Solutions, 2nd Edition.	Req
FINT2210	Object-Oriented Programming for Financial Technologies	FINT	3	The course starts with an introduction to the Python programming language, followed by a deeper view of object oriented concepts in both Java and Python, with a focus on inheritance, polymorphism and events.	Req

FINT3010	Cases in Financial Technologies	FINT	3	Surveys the current state of financial technologies internationally, including innovations and the state of the art in payments and micro-payments, distributed finance, micro-lending, robo-advising, algorithmic trading, open-data and interoperability, regulatory technologies. Students are asked to critically study real of hypothetical cases of applications of financial technologies and identify benefits, drawbacks and threats, both from a technical but also from an economic, environmental and societal / social justice viewpoint.	Req
FINT3310	Data and Knowledge Management	FINT	3	An introduction to data and knowledge management systems. Topics covered are conceptual modelling, relational database design and querying, ontology representation and querying using W3C standards. A survey of modern data management technologies (e.g. NoSQL, columnar) in preparation for advanced courses on the topic is also offered.	Req
FINT3320	Machine Learning for Finance	FINT	3	Introduction to machine learning as it applies to finance. Topics include linear models for regression and classification, kernel models, mixture models and cluster analysis, applied over financial data. A thorough discussion of performance analysis is also offered.	Req
FINT3410	Networks and Distributed Systems	FINT	3	Introduction to computer networks with a special focus on the Internet architecture. Topics include the layered architecture, addressing, naming, routing, common application protocols (web, email) and security. Students develop a distributed application through low-level socket programming.	Req
FINT3620	Financial Intermediation and Risk Management in Banking	FINT	3	Theories of financial intermediation, risks and risk management in banking (including liquidity and interest rate risk), balance sheet management, capital adequacy and securitization, performance measurement. Example Books: Bessis, J. Risk Management in Banking. Chichester: Wiley. Matthews, K. and J. Thompson The Economics of Banking. Chichester: Wiley. Saunders, A. and M.M. Cornett Financial Institutions Management: A Risk Management Approach. New York: McGraw Hill.	Req

FINT4000	Capstone Project in FinTech	FINT	3	Students take on a real or hypothetical problem in the financial domain and conceptualize, design, prototype or otherwise deeply study a technological solution to that problem. Projects include the development of a new financial technology service, such as a mobile app or a decentralized finance application, analyses of mass adoption of a proposed technology, security and reliability analyses of an existing technology, evaluations and recommendations of policies pertaining to the adoption of financial technologies, a business plan for FinTech startup. A critical analysis of their subject of study or proposal with respect to environmental, societal, and economic aspects is an integral part of the studies. Students work in groups on given or self-defined topics.	Req
FINT4220	Engineering Financial Software	FINT	3	Introduction to the process for designing, building and maintaining large software systems and well as managing a software development capability. Topics include lifecycles and their main activities (planning, requirements, analysis and specification, design), maintenance, documentation, software metrics and estimation, software project management, staffing, directing and control, estimating, scheduling, monitoring, risk management, and use of tools (incl. configuration management).	Req
FINT4230	Software Quality Assurance	FINT	3	Methods of testing, verification and validation, quality assurance processes and techniques, methods and types of testing, and ISO 9000/SEI CMM process evaluation. Special focus on security and practices for developing secure software and software for trading and distributed finance (e.g., smart contracts).	Req
FINT4350	Advanced Topics in Machine Learning	FINT	3	A course on artificial neural networks and deep learning. Introduces the basic concepts, training algorithms, network types and architectures for different problems. Special focus on problems recurring in the financial domain.	Opt/Elect
FINT4610	Quantitative Analysis for Financial Decision Making	FINT	3	The course is centered on decision-making situations in the financial service industry. Students learn how to formulate problems, objectives, and constraints, construct	Req

				mathematical models, develop solutions, and interpret the results. The topics include linear programming, integer programming, and multi-criteria decision analysis.	
FINT4620	Capital Markets and Trading	FINT	3	Continues the presentation of ITEC2010 by adding technical depth and practical details on the structure and function of capital markets. Topics include: types of markets, applied financial analytics and modeling, trading systems and introduction to algorithmic trading. Possible Books: Kuznetsov. The Complete Guide to Capital Markets for Quantitative Professionals and Raja Velu, Maxence Hardy, Daniel Nehren. Algorithmic Trading and Quantitative Strategies	Opt/Elect
FINT4630	Investment Management	FINT	3	Building on FINT4610, it focuses on portfolio management and optimization: portfolio theory and mean-variance analysis, parameter estimation and optimization, equity portfolios, fixed-income management, global investing, performance measurement, client behavior and ethics. Example Text: Stewart et al. Portfolio Management: Theory and Practice	Opt/Elect
FINT4720	Payment Systems and Cryptocurrencies	FINT	3	This course introduces the payment systems that move money among consumers and enterprises, and the concept of digital money. Students will examine how payment systems work, how they evolved, and the future of payment technology, from mobile payments to tokenization. Students will also develop an understanding of how to contrast the individual purposes and architectures of different cryptocurrencies. They will explore alternative consensus protocols, with special attention given to Proof of Work (PoW). Additional topics include the 51% network attack, the welfare costs and benefits of cryptocurrencies and the surrounding legal issues.	Req
FINT4730	Financial Cryptography and Blockchain	FINT	3	Offers an overview of common applications of cryptography in the financial domain. An introduction to various key applications and concerns (e-payments, voting, auctions, digital rights and watermarking, identity management in light of confidentiality, integrity, non-repudiation, privacy and anonymity concerns) is followed by a	Req

				description of dominant blockchain technologies, with the focus on their architectures and their consensus layer.	
FINT3900	Internship in Financial Technologies	FINT	0	A paid, full-time work experience with an industry partner from the FinTech space. It requires students to take a break from fulltime academic studies for the duration of the work term (either 4, 8, 12 or 16 months of employment). After accepting an internship job offer at a company, students are enrolled in this course that supports learning and reflection during the work experience and maintains students' fulltime status at the University. Industry supervisors to provide feedback and evaluation of students' workplace performance and relevant skills, which in addition to students' own critical reflection on the experience, are used to assess the credit/no credit grade for the work term course. Assessment is exclusively performed by a full-time faculty member of the program.	
ITEC2622	Data Structures	ITEC	3	A completion to introductory problem solving and algorithm development. Taught in Java, topics include linked lists, binary trees, stacks, queues and other elementary data structures. Complexity analysis is introduced with an emphasis on searching and sorting algorithms. Note: This course will not count for computer science major or minor credit.	Req
ITEC3310	Data Visualization	ITEC	3	Focuses on designing and implementing data visualization techniques to support exploratory analysis, statistical modeling, and presentation of results from large datasets. Topics include principles of visual perception, data cleaning, implementing static and interactive visualizations, and data storytelling with visualization. Students get hands-on experience by implementing visualizations using programming libraries and completing projects in groups.	Opt/Elect
MATH1013	Applied Calculus I	MATH	3	Introduction to the theory and applications of both differential and integral calculus. Limits. Derivatives of algebraic and trigonometric functions. Riemann sums, definite integrals and the Fundamental Theorem of Calculus. Logarithms and	Req

				exponentials, Extreme value problems, Related rates, Areas and Volumes.	
MATH1014	Applied Calculus II	MATH	3	Calculus in Polar Coordinates. Techniques of Integration. Indeterminate Forms. Improper Integrals. Sequences, infinite series and power series. Approximations. Introduction to ordinary differential equations.	Req
MATH1131	Introduction to Statistics I	MATH	3	Displaying and describing distributions; relations in categorical data; Simpson's paradox and the need for design; experimental design and sampling design; randomization; probability laws and models; central limit theorem; statistical inference including confidence intervals and tests of significance; matched pairs; simulation.	Req
MATH2030	Elementary Probability	MATH	3	Introduction to the theory of probability as preparation for further study in either mathematical or applied probability and statistics. Topics include probability spaces, conditional probability, independence, random variables, distribution functions, expectation, Chebyshev's inequality, common distributions, moment-generating functions and limit theorems.	Req
MATH2280	Theory of Interest (Fixed Income)	MATH	3	Measurement of interest, annuities, amortization of loans, bonds, sinking funds and depreciation.	Req
MATH2281	Models of Financial Economics	MATH	3	A quantitative introduction to financial economics. The topics include arbitrage pricing theory, forwards and futures, American and European options, interest rate derivatives, yield curves, arbitrage hedging and pricing, put-call parity, arbitrage bounds, binomial model, Black-Scholes formula, risk-neutral valuation, trinomial model.	Req
MATH3285	Quantitative Finance	MATH	3	A comprehensive introduction to continuous-time Mathematical Finance. This course introduces Brownian motion and Ito calculus and covers interest rate models and derivatives, the Black-Scholes model and the Black-Scholes partial differential equation, implied volatility and Merton's optimal portfolio problem. Example Textbook: Hull's Options, Futures, and other Derivatives	Opt/Elect.

Note that full course proposals for new courses have not been included in this proposal because their development will lay with the new faculty hired for this program (see Section “7. Resources”, for more detail about these hires). Greater content-area expertise, pertinent research and specialization, industry contacts, and knowledge of industry trends are all central elements of these courses and thus new faculty recruited to teach and further develop this program are the lynchpins in the definition and development of these courses. The above short descriptions narrate how we currently understand these courses fitting into this new program.

4.3 Anticipated Class Sizes

Comment on the anticipated class sizes.

A complete list of courses with the anticipated class size for each course can be found in Appendix A. Courses designated as FINT are new courses offered by this new program, while the course with recognizable rubrics are currently offered courses. This chart indicates class size and the projected number of sections for each course. Specifically:

- Foundational courses (1st and 2nd year) are capped at 100 students/section.
- Technology courses for years 1-3 requiring lab are capped at 35 students per section.
- All 4th year courses are capped at 20 students per section.

These estimates have been developed in alignment with the space capacity at of the Markham campus.

4.5. Program Requirements – Calendar Presentation

As an appendix, provide a copy of the program requirements as they will appear in the Undergraduate Academic Calendar.

The following is the calendar presentation of the curricular structure.

Financial Technologies- Honours Bachelor of Science

The School of Information Technology offers an Honours Bachelor of Science (120 credits) in Financial Technologies. This major is offered at Markham Campus.

Honours Program (120 credits):

The honours program core (78 credits) is defined as:

- AP/ECON 1000 3.00
- AP/ECON 1010 3.00
- SC/MATH 1013 3.00
- SC/MATH 1014 3.00
- SC/MATH 1131 3.00

- AP/FINT 1210 3.00
- AP/FINT 2210 3.00
- LE/CSSD 2221 3.00
- SC/MATH 2030 3.00
- SC/MATH 2280 3.00
- SC/MATH 2281 3.00
- AP/ADMS 2500 3.00
- AP/FINT 2010 3.00
- SC/MATH 3285 3.00 or AP/ADMS3500
- AP/FINT 3410 3.00
- AP/FINT 3310 3.00
- LE/CSSD 2221 3.00
- AP/FINT 3010 3.00
- AP/FINT 3620 3.00
- AP/FINT 3320 3.00
- AP/FINT 4610 3.00
- AP/FINT 4220 3.00
- AP/FINT 4720 3.00
- AP/FINT 4730 3.00
- AP/FINT 4230 3.00
- AP/FINT 4000 3.00

A. General education (30 credits):

- Non-science requirement—at least 15 credits
 - 9.00 credits in either the humanities or social science categories from the approved list of Liberal Arts & Professional Studies general education courses
 - 6.00 credits from the opposite category (social science or humanities) from the approved list of Liberal Arts & Professional Studies general education courses
- 1000-level Mathematics (excluding modified courses)—at least 6 credits
 - satisfied by SC/MATH 1013 3.00 and SC/MATH 1025 3.00
- 1000-level computation courses—at least 3 credits
 - satisfied by LE/CSSD 1201 3.00
- 1000-level foundational science—at least 6 credits from courses with laboratories in either BIOL, CHEM, PHYS (this requirement meets York’s BSc Matrix legislation and is completed in place of the 6.00 NATS requirement in the Faculty of Liberal Arts & Professional Studies general education requirements).

B. Major Requirements

- The program core, as specified above (78 credits)

C. Additional credits

- 12 credits of additional credits from the following:
 - AP/FINT4350 3.00
 - AP/ITEC 3310 3.00
 - LE/CSSD 3221 3.00
 - LE/CSSD2211 3.00
 - LE/CSSD3xxx 3.00
 - AP/ENTP 4945 3.00
 - AP/FINT4350 3.00
 - AP/FINT 4620 3.00

D. Science Elective

- BSc degrees at York are required to contain at least 24 credits in science disciplines outside the major (from BIOL, BCHM, BPHS, CHEM, CSE, EATS, GEOG, KINE, MATH, PHYS, PSYC, STS of which at least 3 credits must be at the 2000 level or higher, including:
 - SC/MATH 1131 3.00;
 - SC/MATH 2030 3.00;
 - SC/MATH 2280 3.00;
 - SC/MATH 2281 3.00
 - General education requirements specified above

E. Upper Level Requirement

- At least 42 credits at 3000 or 4000 level (satisfied by the FINT Honours program core)

5. Program Structure, Learning Outcomes and Assessment

The intent of this section is to provide reviewers with an understanding of the knowledge, methodologies, and skills students will have acquired by the time they complete the program (i.e. the program learning outcomes), including the appropriateness of the program learning outcomes and how they will be supported and demonstrated. With that in mind, and with explicit reference to the relevant degree level expectations, it would be useful to focus on what students in the program will know and/or be able to do by the end of a defined period of time and how that knowledge, methodology and/or skill will be supported and demonstrated.

5.1 Program Learning Outcomes and Assessment

5.1.a) Program Level Outcomes (PO's)

Provide the program learning outcomes along with a description of how these are appropriate and align with the relevant degree level expectations. Programs should have eight to twelve program learning outcomes.

The program level outcomes are as follows:

- LO1. Identify, model, analyze, and communicate financial phenomena, problems, and systems with computational and mathematical techniques and technologies

- LO2. Make informed financial decisions using computational and mathematical techniques and technologies
- LO3. Develop secure and high-assurance computing and information systems for solving financial or other business problems
- LO4. Recognize and respond to innovative technologies emerging in the industry
- LO5. Recognize and comply with regulatory, legal, and ethical practices and policies pertaining to financial and technological industries.
- LO6. Identify, describe, and critically analyze the limitations of information and computing technologies in reliably, securely and safely addressing financial problems, and recognize and describe their impact to economies, societies and cultures.

These Learning Outcomes describe and define the different knowledge, skills, and experiences that are part of this interdisciplinary program. In short, Finance courses are most represented through LO1, technical courses pertaining to software development support LO3, while LO2 is predominately supported by courses pertaining to topics such as data analysis, AI, Visualization, along others. LO4 and LO6 are supported by technology courses, especially the newly proposed courses, while LO5 is most advanced through the innovative and interdisciplinary integrative courses.

Further, while these Learning Outcomes are unique to the currently proposed FinTech program, they have been designed to meet the degree level expectations defined across the province. In the chart below, the relationship between the program POs and the Degree Level Expectations (DLEs) are mapped. Whenever a PO substantially supports fulfillment of a DLE the corresponding cell is marked.

	LO1: Identify, model, analyze, and communicate financial phenomena, problems, and systems with computational and mathematical techniques and technologies.	LO2: Make informed financial decisions using computational and mathematical techniques and technologies	LO3: Develop secure and high-assurance computing and information systems for solving financial or other business problems.	LO4: Recognize and respond to innovative technologies emerging in the industry	LO5: Recognize and comply with regulatory, legal, and ethical practices and policies pertaining to financial and technological industries	LO6: Identify, describe, and critically analyze the limitations of information and computing technologies in reliably, securely and safely addressing financial problems [...]
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<i>Depth and Breadth of Knowledge</i>	✓	✓		✓	✓	
<i>Knowledge of Methodologies</i>	✓	✓	✓			
<i>Application of Knowledge</i>		✓	✓		✓	
<i>Communication Skills</i>		✓		✓	✓	

Awareness of Limits of Knowledge					✓
Autonomy and Professional Capacity	✓	✓	✓		✓

Table 4. POs vs. DLEs

In Sum:

- Depth and Breadth of Knowledge is met by LO1, LO2, LO4, LO5
- Knowledge of Methodologies is met by LO1, LO2, LO3
- Application of Knowledge is met by LO2, LO3
- Communication Skills is met by LO2, LO4, LO5
- Awareness of Limits of Knowledge is met by LO6
- Autonomy and Professional Capacity is met by LO2, LO3, LO4, LO6

5.1.b) Program Curriculum vs. Program Learning Outcomes.

Describe how the program curriculum and structure supports achievement of the program learning outcomes.

For undergraduate programs, comment on the nature and suitability of students' final-year academic achievement in the program.

Provide a program curriculum map to demonstrate the above. This may be an appendix to the proposal document.

Appendix B shows a curriculum chart that maps each of the core program courses to the appropriate LO. Along with the mapping of the courses to the LOs, also note that we have identified:

- Whether the course is Foundational (Found.) to that LO (ie the course builds the foundation for more advanced courses in this area), Related to that LO (ie the course is connected to, but not directly met by, the outcome), or Direct to the LO (the course is important for achievement of the outcome).
- Whether courses provide an Introductory (Intro), Intermediate (Inter), or Advanced (Adv.) treatment of content, thus also identifying the progressive achievement of these outcomes.
- The expected form of assessment to track the LOs, namely: Exams and Tests (E), Assignments (A), Labs Tests (L), Group Project (GP), Essays and research papers (S). We expect to continuously broaden and further refine this list as the courses develop.

5.1.c) Assessment

Describe how student achievement of each of the program learning outcomes is assessed, how that assessment is documented and how the methods and criteria for assessing student achievement are appropriate and effective relative to the program learning outcomes.

It is projected that the following assessments will be used in courses throughout the program, as mapped above/in Appendix B. Assessment strategies include:

- Exams and tests (E): including midterm and final exams and quizzes, whereby students respond in written to questions posed by the exam statement. Multiple-choice and open questions are promoted, with instructors making a judgement on the appropriateness of each question type.
 - Assessment method is applicable to all courses, particularly junior ones.
- Lab tests(L): take place in the lab and students are asked to solve a problem using a software system and do so within a limited time.
 - Utilized in programming and statistical courses, where development and tool use skills are developed.
- Assignments (A): Students are given exercises and questions to be responded to within a certain deadline. In the flipped classroom model, solution of assignments can take place in class under the supervision of the instructor.
 - Suitable for most courses.
- Group Projects (GP): Students are presented with a large case or objective which they progressively address throughout the term. A term project is typically group-based and may involve several assessable results, including:
 - Reports presenting the outcome of a phase
 - Presentations of the outcome of a phase.
 - Developed artifacts, including software code or data products.
 - Clear project management and co-ordination evidence.

Term projects are suitable for upper-level courses where knowledge of the foundational technologies and methods can be assumed and complex and more realistic cases can now be entertained.

- Essays and research papers (S): Students are asked to critically analyze a problem or situation. The analysis may involve lightweight researching of information about specific cases, regions or events. Essays and research papers are suitable for integrative courses whereby students attain deeper understanding of how the technologies apply in reality. Essays can be replaced by presentations/talks with the same content.

Examples of these include:

- Benefits, threats and pitfalls of applying certain technologies to the financial domain, possibly using cases.
- Analysis of a success or a failure case of a financial technology.
- Presentation and analysis of the state of financial technologies in a country or region.
- Analysis of socio-technical phenomena emerging from the application of financial technologies, e.g. cryptocurrencies, sustainability, crime inequality and social inclusion, algorithmic trading and “flash-crashes”, AI and discrimination.
- Contemplation of policy and regulatory interventions to address negative implications of financial technologies.

Note that the above methods are generally understood to be the main assessment methods of a technical or engineering degree. The uniqueness of the program is the addition of essay and research paper components, where societal, economic, historical, political and regional aspects are analyzed and critically addressed and the corresponding modes of communication are cultivated (free-form essays, talks). However, as the program grows, differentiation and innovation in assessment will develop to best respond to changing needs.

5.1.d) Post Graduation Assessment

Describe how the program will document and demonstrate that, upon graduation, students will have achieved all degree level expectations as specified by the program learning outcomes. How will this information be used to inform continuous improvement of the program? (For more information: <https://oucqa.ca/guide/assessment-of-teaching-and-learning-2-1-6-a-and-b/>)

The program shall assess long-term achievement of POs through at least three avenues:

- Through social media and events, the program shall maintain strong alumni relations, engaging alumni and their employers regularly to assess whether the set POs are accomplished or require curricular re-alignment or even an update of the POs themselves. The evidence acquisition would include polling (surveys) and focus groups, involving self-reported assessments from participants.
- The internship component shall include opportunities for employers to perform assessment of skill gaps on the part of the interns. These assessments will allow the program's curriculum governance to understand which PO's are underserved and perform the appropriate corrections.
- Continuous (e.g., annual vs. every Cyclical Program Review) review and update of Course Level Outcomes (COs) and mappings thereof with POs, as well as communication across instructors will be encouraged by the program's curriculum governance, so that misalignments and drifts are identified and corrected promptly.

5.1.e) Progression and Graduation Requirements

Include a description of the progression requirements for the degree program and the graduation requirements.

Standing and graduation requirements:

Progression and graduation requirements: to graduate, students are required to successfully complete all Faculty requirements and departmental required courses and achieve a minimum CGPA of 5.00 (C+). Progression and graduation requirements for the new program align with the University's current Honours Progression Requirements. It is important to note that a foundational revision to the University's grading scheme is underway and we will update our progression requirements to align with the new framework. [Then the rest of that paragraph and the bullet points would be deleted. The graduation requirements section that follows can be left as is.]

Graduation Requirements:

Graduation requirements are set out by the Faculty Rules for all undergraduate programs in the Faculty of Liberal Arts & Professional Studies and align to relevant University policies such as the established grading schemes, some of which will be modified for MC:

- Residency requirement: a minimum of 30 course credits and at least half (50 per cent) of the course credits required in each undergraduate degree program major/minor must be taken at York University;
- Graduation requirement: students must successfully complete (pass) at least 120 credits which meet the Faculty's degree and program requirements with a cumulative grade point average of at least 2.00 and a major grade point average of at least 2.3;

- General education: to fulfill the liberal arts & professional studies general education requirements students must take 21 credits of general education including: 6.00 credits in natural science (NATS) [Financial Technologies students will meet a parallel requirement to the NATS course by completing the non-FINT science courses stipulated in the BSc general education requirements]; A 9.00 credit approved general education course in the social science or humanities categories; and a 6.00 credit approved general education course in the opposite category to the 9.00 credit course in the social science or humanities already taken.
- Major/minor credits: as defined by the specific program; a minimum of 78 credits, including at least 18 credits at the 4000 level;
- Upper-level credits: at least 42 credits at the 3000 or 4000 level including at least 18 credits at the 4000 level;
- Science Electives: at least 24 credits in Science disciplines outside the major which includes non-major GenEds and required science credits not in major discipline (all MATH) credits.

General Prerequisites:

- Taking any 2000-level course requires completion of all mandatory 1000 credits, with the following exceptions:
 - Completing all but 3.0 required 1000-level credits allows students to enroll in half of the credits of 2000-level courses, assuming the course-level prerequisites are met.
 - Completing all but 6.0 required 1000-level credits allows students to enroll at most 9.0 credits in 2000-level courses, assuming the course-level prerequisites are met.
- Taking any 3000-level course requires completion of all mandatory 2000-level courses, with the following exceptions:
 - Completing all but 3.0 required 2000-level credits allows students to enroll in half of the credits of 3000-level courses, assuming the course-level prerequisites are met.
 - Completing all but 6.0 required 2000-level credits allows students to enroll at most 9.0 credits in 3000-level courses, assuming the course-level prerequisites are met.

5.2. Modes of Delivery

Describe the proposed mode(s) of delivery, including how it/they are appropriate to and effective in supporting the program learning outcomes.

The proposed program follows specific guidelines with regards to how the newly developed technology and integrative courses are to be taught and offers these guidelines as recommendations to be followed by the service courses offered by other departments.

Specifically, wherever applicable:

- Courses shall be taught in a *flipped classroom* format, whereby content delivery takes place asynchronously through video presentations and the majority of synchronous meeting time is dedicated towards collaborative student activities.

- A *blended* teaching format will be promoted, where part of class activities is synchronously and asynchronously conducted on-line, using tools and collaboration approaches followed by modern virtual organizations.
- In-person meetings would prioritize lab, open classroom or collaborative spaces whereby maximizing the opportunity for hands-on and collaborative learning activities amongst students.

The goals of the proposed teaching approaches are as follows:

- Simulate, wherever possible, the professional approaches for collaboration and work organization, including project management and communication approaches and techniques.
- Enable a hands-on, learning-by-doing approach and minimizing passive transfer of information (lecturing).
- Enable strong connections and collaborative relationships among students.
- Familiarize students with on-line forms of work, learning and collaboration.

5.3. Experiential Education

Describe the experiential components of the program, if applicable. These may include a wide variety of options, including classroom-based activities, community-based learning, or internships and co-op placements. Describe how students are supervised and assessed when participating in experiential education activities outside of the classroom.

Experiential education will be built into many courses in this program. Most senior-level courses, including courses on computer programming, software engineering, and machine learning, include term-long projects whereby students individually or collaboratively develop a solution for a realistic problem (e.g., design an application, implement a solution, analyze open-source data).

More specifically, however, experiential education will be prioritized in shaping the program in three main ways:

1. The Financial Technology *Internship* constitutes a 0-credit opportunity for Honors students who meet certain requirements [specified below], to work for 3, 6, or 8 months in a company in the Financial Technology sector.

These internships would be part of the campus-wide internship capability developed for Markham and its educational and administrative aspects shall be modeled after LA&PSs corresponding internships programs (e.g., the TIP the technology internship program).

- Students eligible for internship have (a) a major GPA of at least 6.0, (b) and have finished 54 credits, (c) are registered in the 120-credit Honours program, (d) are in good academic standing.
- The internship comes in the form of a 0-credit course, ITEC3900, within which learning and reflection during the work experience is supported and systematized with student developing skill and competency development goals and writing reflection and self-assessment reports. These, combined with employer feedback are systematically observed by a full-time faculty member, an internship co-ordinator, who assigns the final PASS/FAIL grade for the course.

2. The third-year course, “Cases in Financial Technologies” will be focused on collaborative technological problem solving where students will use real world cases in the financial technologies sector (historical or contemporary interest) to discover how technology has shaped the financial sector and how they can evolve these innovations for the future.
3. The fourth-year course “Capstone Project in Financial Technologies,” students are given a realistic business case, i.e., a problem from the financial sector to be solved through the development of the technology, and the students work the entire term to collaboratively design, implement and present a solution. Examples of solutions may include developing a new financial product or service, designing and developing a bidding or trading platform, developing data products for performing specific data analyses and visualizations, analyzing the performance, reliability and security of an existing system. Wherever available, such cases will emerge from industrial problems with some participation from industry stakeholders for offering requirements and grading the final outcome.

6. Admission Requirements

6.1. Admission Requirements – Description

Describe the program admission requirements, including the language proficiency requirements.

Domestic Students

Ontario High School Students:

- Ontario Secondary School Diploma (OSSD)
- ENG4U
- SBI4U or SCH4U or SPH4U
- MHF4U
- Three additional 4U or M courses.
 - MCV4U recommended

Target GPA: low 80s

University Transfers:

- Completion of at least four full-year courses or one year of full-time degree studies at an accredited university
- Overall average of 3.0 or better on a 4-point scale (or equivalent)
- SBI4U or SCH4U or SPH4U
- MHF4U
- 4U Math - MCV4U recommended

College Transfers:

- Completion of at least four full-year courses or one year of full-time degree studies at an accredited university
- Overall average of 3.3 or better on a 4-point scale (or equivalent)
- SBI4U or SCH4U or SPH4U
- MHF4U

- 4U Math - MCV4U recommended

Visa 101 Students (examples):

Language requirements:

- TOEFL (iBT): 88 (no score below 20 in each section)
- IELTS: 6.5 (no score below 6.0 in each section)
- Pearson PTE: 60
- DuoLingo: 115

6.2. Requirements vs. LOs

Provide a brief explanation how these requirements are appropriate for the achievement of the program learning outcomes.

- Given the heavy mathematical and computing components of the program, the requirements are modelled after the corresponding requirements of the Mathematics and Computer Science BSc. They also satisfy the requirements of LA&PS's Financial and Business Economics, which require less math.
 - Science courses are required in accordance to the BSc designation, and the expected lab requirements as part of the required non-major science credits.
- The program being technically and mathematically demanding, evidence of high performance in mathematics is required again in accordance to corresponding requirements already posed by Computer Science BSc.
- English requirements are again modeled after Lassonde's effective requirements and are generally York University's minima – except for a slightly higher TOEFL.

6.3. Alternative Requirements

Explain any alternative requirements, if any, for admission into an undergraduate, graduate or second-entry program, such as minimum grade point average, additional languages or portfolios, along with how the program recognizes prior work or learning experience.

Minimum GPA requirements for various non-101 categories are specified above. There are no additional requirements posed by the program. The content of the program is such that work experience is not recognized for admission.

7. Resources

This section provides a description of the resources available to support the delivery of the program and support of students' achievement of the program learning outcomes. In addition to the descriptions, the three tables at the end of this section provide evidence of the above.

7.1. Faculty

Describe the areas of strength and expertise of the faculty who will actively participate in delivering and further developing the program, focusing on their current status and ability to foster a robust intellectual climate.

Prof. Sotirios Liaskos	Sotirios Liaskos is an Associate Professor and 2-term Director of the School of Information Technology York University. He is interested in various aspects of Software Engineering including Requirements Engineering and Conceptual Modelling as well as the analysis and evaluation of Blockchain network technologies. Prof. Liaskos can participate in the teaching and further development of the software engineering aspect of the program as well as the teaching of blockchain-related courses.
Prof. Andrea Podhorsky	Andrea Podhorsky is an Assistant Professor in the Department of Economics. In addition to a PhD in Economics, she holds an MS in Computational Finance and studies the economic impacts of cryptocurrencies and public policy measures for overseeing fintech. She can participate in the teaching and further development of the economics and finance aspects of the program as well as the teaching of economics and cryptocurrency-related courses.
Prof. Zijiang Yang	Zijiang Yang is a professor in the School of Information Technology at York University. She used to be two-term graduate program director and is currently undergraduate program director of the school. Her research interests include machine learning and optimization in the financial service industry. She can participate in teaching machine learning and operations research related courses.

Describe plans to provide further resources that may be necessary to implement and/or sustain the program.

Please see below “Resources and Class sizes” for hiring plan.

7.2. Contract and retired faculty

Comment on the anticipated role of retired faculty and contract instructors in the delivery of the program, as appropriate.

7.2.1. Part-Time Instructors

The professional orientation of the program makes it suitable for teaching contributions from part-time instructors with a strong professional record in the Financial, FinTech and Tech industries. The FTF hiring projections are based on the assumption of 30% of the sections to be taught by such part-time instructors.

7.2.2. Retired Faculty

The following retired faculty member can make contributions to the program particularly in the integrative courses and the capstone projects.

Prof. Chris Robinson	Chris Robinson, Professor Emeritus of Finance and Senior Scholar, has been teaching, conducting research, writing textbooks, intervening in regulatory matters and working in legal proceedings for 35 years in all aspects of personal financial planning and ethics in finance. He has won awards for
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	research, teaching, university service and journalism. His current research projects include professionalisation of financial planning in Canada, Australia and South Africa, financial counselling in Canada and Australia, the effect of robo-advising on investment advisers and comprehensive stochastic retirement planning. He has a PhD in Finance from the University of Toronto and is a Certified Financial Planner and Chartered Professional Accountant. In 2011 he was named one of the inaugural Fellows of FP Canada.
Prof. Gary Spraakman	Gary Spraakman PhD, FCPA, FCMA is a professor emeritus and senior scholar at York University. Before his retirement in 2021, he was a full professor of management accounting and information technology. He has taught undergraduate and graduate courses relating to information technology including on Organization Strategy and IT (graduate), Management Information Systems and Enterprise Resource Planning. His research interests focus on the use of IT and data analytics for managing organizations. Earlier in 2021, with two other professors, he published an empirical paper, Data Analytics and Management Accountants.

The hiring plan outlined in Section 7.6. Resources and Class sizes” and Table 8 presents 10 FTFE which, assuming an 1.75 FCE/year per resource.

7.3. Laboratory Facilities/Equipment

Where applicable, identify major laboratory facilities/studio space/equipment that will be available for use by undergraduate and/or graduate students and to support faculty research, recent acquisitions, and commitments/plans (if any) for the next five years.

Lab Space:

The program will heavily rely on access to technology as well as collaboration infrastructure for the support of the flipped classroom model. Specifically:

- For courses with a strong computational component, meetings (including exams) will be run in a computer lab environment whereby students can solve exercises, collaborate and perform activities through the use of computers and computer software.
- Computing configuration shall be similar to the one currently offered by LA&PS’s eServices.
- Some classes, such as the Introduction to Financial Technologies, the Cases in Financial Technologies and the Capstone project, will run in rooms where collaboration among students is facilitated, i.e., students are seated in round tables.
- Server capacity will be required for certain courses that heavily rely on such, including the course on Blockchain as well as software engineering. While the Keele server infrastructure will be suitable initially, additional capability will be added according to needs.

The MC has computer lab space and collaborative teaching space available to meet the above requirements.

The plans currently include one instructional laboratory in each of the Physics, Biology, and Chemistry disciplines as well as a robust suite of preparation and support spaces. These will cover the GenEd and

Science requirements of the proposed program. There are six state-of-the-art computer labs for instruction that will meet the needs for dedicated in-lab instruction.

There is also an Experiential Education Hub on floor 3 intended to provide administrative space and support for upper year student work on Capstone Projects and act as an intersection for work with Industry partners, students, and faculty.

7.4. Office, Laboratory and Research Space

Describe the office, laboratory and general research space available that will be available for faculty, undergraduate and/or graduate students, including the availability of common rooms for faculty and graduate students, administrative space. If applicable, describe any commitments/plans for the next five years.

Laboratory and general research space have been described in section 7.3 above. It is worth noting that as new research clusters are formed it is expected that they will be accommodated within space assigned to Faculty Offices or should the demand require it other spaces will be reassigned to this purpose until growth requires fit out of floors 9 and 10 to house larger groups.

Like every other Faculty, LA&PS has a suite of offices for faculty members and administrative staff. Each of these suites has access to meeting rooms of various sizes, networking lounge space, kitchenettes and various filing and storage facilities. LA&PS occupies almost the entire 8th floor which is equipped as but also offers separate enclosed lounge/ study spaces for graduate and undergraduate students.

Within this space, the Financial Technologies Lab will be available to students of the involved faculty members who engage in research.

- The lab, which may consist of various rooms, features hot desks with large dual-screen docking stations for faculty, undergraduate research project students, graduate students, researchers, visitors, as well as small collaboration meeting desks and rooms.
- In terms of number of seats, the lab is able to house at least *three (3) group members per FTF affiliated with the program*. This guaranteed space will be important for attracting research-intensive FTF to the program.
 - This space guarantee for research faculty can be in part provided by space earmarked for research clusters related to Financial Technologies, or it may be part of a unified space dedicated to FinTech research.
 - Floors 9 and 10 can be utilized for meeting these requirements, should floor 8 become full.

There are several large study areas in the Library to support varying degrees of activity and quiet. Rooms are furnished and designated to permit collaborative work, quiet study and mixed-use including study and socializing. Every floor in the building except floors 7 and 8 has informal student lounge and study space off the main corridors. On the classroom floors 4 and 5 there is also significant bench seating installed in corridors, equipped with power to allow students to connect their devices while filling in time between their classes.

Faculty administrative support is lodged with the faculty office spaces on floors 7 and 8. There is also a suite of offices for the Deputy Provost functions on floor 7. All faculty and staff offices are on floor 3 with the Library collection, study spaces, editing suites, Gaming lab and Maker space. All student Service functions including Advising, Counseling, Alternate Exam facilities, Supplemental Instruction and Tutoring are located on floors 1 and 2.

7.5. Academic Supports and Services

As appropriate, comment on academic supports and services, including information technology, that directly contribute to the academic quality of the program proposed.

The proposed program will be supported and supplemented by a suite of academic success supports and services that contribute to the quality of the program and the success of students. They include academic advising, accessibility services, general learning skills (e.g., time management, critical thinking, reading and note-taking), discipline specific supports (e.g., writing and numeracy skills), and peer-based learning supports such as peer tutoring and Supplemental Instruction. Students’ sense of belonging and community within their program is strengthened through a robust first year orientation and transition program, the active involvement of peer mentors, and a program specific student club/organization. To round out the student experience, students will have access to both in-person and remote student services delivered by staff based at Markham and Keele campuses. Wholistic student services include registrarial services, student finances and bursaries, health and wellness support and programs, and student activities and involvement programs.

7.6. Resources and Class sizes

Describe how the available resources will support the anticipated class sizes and supervision of any experiential education activities.

Table 5. Projected Enrollments

	2023	2024	2025	2026	2027	2028	2029	Retention Rate
1	60	72	87	107	150	200	200	
2	0	48	58	70	86	120	160	0.8
3	0	0	38	46	56	69	96	0.8
4	0	0	0	30	37	45	55	0.8
Total Sections:	2	4	12	29	37	41	59	

Table 6. Annual Number of Sections per Expert

Row Labels	Section for 2023	Sections for 2024	Sections for 2025	Sections for 2026	Sections for 2027	Sections for 2028	Sections for Steady (2029+)
AI Specialist		0	0	1	3	4	4
FT Generalist		0	1	3	3	4	5
Software Engineer		2	3	4	9	10	13
Systems/Networks		0	0	1	1	2	2
FT Specialist		0	0	0	4	4	4
Data and Knowledge Management		0	0	1	1	2	2
Economist/Business		0	0	2	6	8	8
Grand Total		2	4	12	27	34	38

To identify resource needs and hiring requirements for the program, the projected enrollments of Table 5 are used to offer a rough estimation of the number of sections needed for each course. A realistic retention rate of 80% is assumed. The results are aggregated above (Table 6) per FT expertise required to teach the sections. Hence the following hiring plan will be required for a healthy student-to-FTF ratio, assuming 70% of sections being taught by FTF and the remaining 30% by PTF. In short, the following are the number of new hires needed the first 7 years, assuming program stays as described here:

Table 7. Hiring Plan - 7 Year Projection

	2023	2024	2025	2026	2027	2028	2029
AI Specialist			1 x AI Specialist				
FT Generalist		1 x FT Generalist					1 x FT Generalist
Software Engineer	1 x Software Engin			1 x Software Engine		1 x Software Engine	
Systems/Networks			1 x Systems/Networ				
FT Specialist				1 x FT Specialist			
Data and Knowledge Management			1 x Data and Knowle				
Economist/Business			1 x Economist/Busir		1 x Economist/Busir		
Total FTF Hires Per Year	0						
Total Per Year	1	1	4	2	1	1	1
Total Hires through 2029	11						

The projections include resources currently residing in Keele campus who will decide to move to Markham. A more detailed picture of the required profiles can be seen below:

Year	Expert	Profile	Acquisition
2023 (2 hires)	Software Engineer	A person with Software Engineering background to take on introductory programming and potentially software engineering courses.	1 tenure-stream junior or senior FTF hire
	FT Generalist	A person with strong FT inclination, probably with a Business background, to prepare and teach the integrative Financial Technology courses of years 2 and 3. Specific specialization area flexible.	1 tenure-stream junior FTF hire
2025 (4 hires)	AI Specialist	A machine learning expert to teach the two Machine Learning courses and grow the AI aspect of the program. Financial background highly desired.	1 tenure-stream junior FTF hire
	Systems/ Networks	A person with expertise Networks and Distributed Systems (incl. consensus networks) and to teach the corresponding courses and grow that aspect.	1 tenure-stream junior FTF hire

	Finance	A Finance expert to take on teaching the finance core and electives. Specific specialization area flexible.	1 tenure-stream junior FTF hire
	Data and Knowledge Management	An expert in data management with knowledge of modern data management and a particular focus on conceptual modelling and ontology engineering, preferably in financial domains.	1 tenure-stream junior/senior FTF hire
2026 (2 hires)	FT Specialist - Blockchain	A person with technical understanding of blockchain technologies (software engineer, networks, distributed systems).	1 tenure-stream junior or senior hire.
	Software Engineering Specialist	A Software Engineer with specialization of high assurance and/or security engineering.	1 tenure-stream junior or senior FTF hire
	Finance	A Finance expert to take on teaching the finance core and electives. Specific specialization area flexible.	1 tenure-stream junior FTF hire
2027 (1 hire)	Finance	A Finance expert to take on teaching the finance core and electives. Specific specialization area flexible.	1 tenure-stream junior FTF hire
2028 (1 hire)	Software Engineer	A Software Engineer of any relevant specialization.	1 tenure-stream junior FTF hire
2029 (1 hire)	FT Generalist	A person with strong FT expertise, of economics, business or management background, to support teaching of the integrative Financial Technology courses of years 2 and 3. Specific specialization area flexible.	1 tenure-stream junior FTF hire

Table 8. Hiring Plan - Detailed Profiles.

7.8. Funding and cost recovery

Indicate whether the new program is intended to be funded or to be a full-cost recovery program.

The proposed program is intended to be funded.

7.9. Other quality indicators

Describe other indicators of the quality of the program that may not have been covered above.

N/A

Table 1 – Listing of Faculty

For undergraduate programs: Identify all full-time faculty who will actively participate in delivering the program, as follows.

Faculty Name & Rank	Home Unit	Area(s) of Specialization
Sotirios Liaskos	School of Information Technology	Software engineering, conceptual modelling, blockchain technologies
Andrea Podhorsky	Department of Economics	Fintech and blockchain technology, corporate social responsibility, international trade and finance.
Zijiang Yang	School of Information Technology	Machine learning, data mining, big data analytics, decision support and optimization in financial services industry

8. Enrolment Projections

Indicate the anticipated implementation date (i.e. year and term of initial in-take) and provide details regarding the anticipated yearly in-take and projected steady-state enrolment target, including when steady-state will be achieved.

The projected enrollments for the program can be viewed on Table 5 of Section 7.6. Resources and Class sizes". The program will increasingly accept more students from 60 in 2023 to 200 in 2028 which represents the steady state. The number of students in years 2 through 4 are calculated by assumed retention rates of 80%, which we assume to be an upper bound for such rate.

9. Support Statements

Support statements are required from:

relevant Dean(s)/Principal, with respect to the adequacy of existing human (administrative and faculty), physical and financial resources necessary to support the program, as well as the commitment to any plans for new/additional resources necessary to implement and/or sustain the program

- *Vice-President Academic and Provost, with respect to the adequacy of existing human (administrative and faculty), physical and financial resources necessary to support the program, as well as the commitment to any plans for new/additional resources necessary to implement and/or sustain the program*
- *University Librarian confirming the adequacy of library holdings and support*
- *University Registrar confirming the implementation schedule and any administrative arrangements*
- *relevant Faculties/units/programs confirming consultation on/support for the proposed program, as appropriate*
- *professional associations, government agencies or policy bodies with respect to the need/demand for the proposed program, as appropriate*

10. Curricula Vitae of the Faculty

Appendix A

Table 9. Class sizes and Projected Yearly Sections

Code	Title	Yr	Size	2023	2024	2025	2026	2027	2028
ADMS2511	Management Information Systems	2	50	0	1	1	1	2	2
ADMS3530	Finance	3	50	0	0	1	1	1	1
CSSD1101C	Introduction to Programming through Finance	1	50	1	1	2	2	3	4
CSSD1201	Coding through Mechatronics	1	50	1	1	2	2	3	4
CSSD2101	Object-Oriented Programming	1	50	1	1	2	2	3	4
FINT3220	Web Programming	3	35	0	0	1	1	2	2
FINT3240	Mobile Computing	3	35	0	0	1	1	2	2
FINT3510	Computer and Network Security	3	35	0	0	1	1	2	2
MATH1025	Applied Linear Algebra	1	100	1	1	1	1	2	2
MATH2131	Introduction to Statistics II	2	40	0	1	1	2	2	3
MATH4280	Risk Theory - Loss Models and Risk Measures	4	20	0	0	0	2	2	2
ADMS2500	Financial Accounting	2	100	0	0	1	1	1	1
CSSD2211	Introduction to Cloud Computing	1	50	1	1	2	2	3	4
CSSD2221	Intro to Security Threats	1	50	1	1	2	2	3	4
CSSD3221	Network Security	1	50	1	1	2	2	3	4
CSSD3xxx	Web and Mobile Programming	1	50	1	1	2	2	3	4
ECON1000	Introduction to Microeconomics	1	100	1	1	1	1	2	2
ECON1010	Introduction to Macroeconomics	1	100	1	1	1	1	2	2
ENTP4945	Technology Entrepreneurship	3	40	0	0	1	1	1	2
FINT1210	Introduction to Programming through Finance	1	35	2	2	2	3	4	6
FINT2010	Introduction to Financial Technologies	2	35	0	1	2	2	2	3
FINT2210	Intermediate Programming for Financial Technologies	2	35	0	1	2	2	2	3
FINT3010	Cases of Financial Technologies	3	35	0	0	1	1	2	2
FINT3310	Data and Knowledge Management	3	35	0	0	1	1	2	2
FINT3320	Machine Learning for Finance	3	35	0	0	1	1	2	2
FINT3410	Networks and Distributed Systems	3	35	0	0	1	1	2	2
FINT3620	Financial Intermediation and Banking	3	35	0	0	1	1	2	2
FINT3630	Investment Management	3	35	0	0	1	1	2	2
FINT4000	Capstone Project in FinTech	4	20	0	0	0	2	2	2
FINT4220	Engineering Financial Software	4	20	0	0	0	2	2	2
FINT4230	Software Quality Assurance	4	20	0	0	0	2	2	2
FINT4350	Advanced Topics in Machine Learning	4	20	0	0	0	2	2	2
FINT4610	Financial Decision Making	4	20	0	0	0	2	2	2
FINT4620	Capital Markets and Trading	4	20	0	0	0	2	2	2
FINT4720	Payment Systems and Cryptocurrencies	4	20	0	0	0	2	2	2
FINT4730	Financial Cryptography and Blockchain	4	20	0	0	0	2	2	2

Program: Financial Technologies		LEARNING OUTCOMES																														
Degree Type: BSc																																
		LO1				LO2				LO3				LO4				LO5				LO6										
1st Year																																
ECON1010	Introduction to Macroeconomics	3	Direct	Intro	F,A	Found	Intro	F,A																								
EINT1210	Introduction to Program through Finance	3										Found	Intro	F,A																		
MATH1012	Applied Calculus I Course Name	3	Found	Intro	F,A	Found	Intro	F,A																								
ECON1000	Introduction to Microeconomics	3	Direct	Intro	E,A	Found	Intro	E,A																								
MATH1014	Applied Calculus II	3	Found	Intro	F,A	Found	Intro	F,A																								
MATH2020	Elementary Probability	3	Direct	Intro	F,A	Found	Intro	F,A																								
MATH3333	Introduction to Statistics I	3	Direct	Intro	F,A	Found	Intro	F,A																								
ADM2230	Financial Accounting	3	Direct	Intro	F,A	Found	Intro	F,A																								
MATH2280	Theory of Interest (Fixed Income)	3	Direct	Inter	E,A	Found	Inter	E,A																								
FIN2240	Intermediate Programming for Financial Technolog	3	1.8									Direct	Inter	E,A,L																		
2nd year																																
MATH2281	Models of Financial Economics	3	Found	Intro	F,A	Direct	Found	Intro	S,A,E,C	Direct	Intro	S,A,E,C	Direct	Intro	S,A,E,C	Direct	Intro	S,A,E,C	Direct	Intro	S,A,E,C	Direct	Intro	S,A,E,C	Direct	Intro	S,A,E,C	Direct	Intro	S,A,E,C		
<i>Credit count</i>		21																														
ITEC2622	Data Structures	3										Found	Direct	Inter	F,A	Relat	Inter	F,A,L,GP														
ITEC3310	Data and Knowledge Management	3										Found	Direct	Inter	F,A	Relat	Inter	F,A,L,GP														
EINT3620	Financial Intermediation and Banking	3	Direct	Inter	F,A																											
MATH3285	Quantitative Finance	3	Direct	Inter	F,A							Direct	Intro	E,A,L	Relat	Intro	E,A,L,GP							Relat	Intro	E,A,L,GP						
ADM3320	Multiple Learning for Finance	3	Direct	Inter	F,A							Direct	Intro	E,A,L	Relat	Intro	E,A,L,GP							Relat	Intro	E,A,L,GP						
EINT3010	Cases in Financial Technologies	3	Direct	Inter	F,GP,C	Direct	Inter	F,GP,C	Direct	Inter	F,GP,C	Direct	Inter	F,GP,C	Direct	Inter	F,GP,C	Direct	Inter	F,GP,C	Direct	Inter	F,GP,C	Direct	Inter	F,GP,C	Direct	Inter	F,GP,C	Direct	Inter	F,GP,C
EINT3410	Networks and Distributed Systems	3										Direct	Inter	E,A,L,GP	Relat	Intro	E,A,L,GP	Relat	Intro	E,A,L,GP	Direct	Intro	E,A,L,GP	Direct	Intro	E,A,L,GP	Direct	Intro	E,A,L,GP	Direct	Intro	E,A,L,GP
3rd year																																
FIN4220	Financial Systems and Currencies	3	Direct	Adv.	E,A							Direct	Adv.	E,GP,C	Relat	Adv.	E,GP						Direct	Adv.	E,GP,C	Relat	Adv.	E,GP	Direct	Adv.	E,GP,C	
FIN4230	Software Quality Assurance	3										Direct	Adv.	E,A	Relat	Adv.	E,GP						Direct	Adv.	E,GP,C	Relat	Adv.	E,GP	Direct	Adv.	E,GP,C	
FIN4370	Financial Cryptography and Blockchain	3	Direct	Adv.	F,A	Direct	Adv.	F,A				Direct	Adv.	E,A	Relat	Adv.	E,GP						Direct	Adv.	E,GP,C	Relat	Adv.	E,GP	Direct	Adv.	E,GP,C	
<i>Credit count</i>		24																														
FIN4610	Financial Decision Making	3	Direct	Adv.	E,A	Direct	Adv.	E,GP,C				Direct	Adv.	E,GP,C	Direct	Adv.	E,GP,C	Direct	Adv.	E,GP,C	Direct	Adv.	E,GP,C	Direct	Adv.	E,GP,C	Direct	Adv.	E,GP,C	Direct	Adv.	E,GP,C
<i>Credit count</i>		18																														
<i>E,GP,C</i>																																
<i>COBE credits</i>		81																														
<i>Major Electives</i>		12 / 24																														
Outside Major (GenEds and Fee Choices)		30																														
FIN4350	Advanced Topics in Machine Learning	3	Relat.	Adv.	E,GP	Direct	Inter.	E,GP															Direct	Intro.	E,GP	Direct	Intro.	E,GP	Direct	Intro.	E,GP	
FIN4445	Entrepreneurship	3										Direct	Inter.	F,A,L,GP									Direct	Intro.	E,A,GP	Direct	Intro.	E,A,GP	Direct	Intro.	E,A,GP	
FIN4330	Investment Management	3	Relat.	Adv.	E,GP	Direct	Inter.	E,GP				Direct	Inter.	F,A,L,GP	Direct	Intro.	E,A						Direct	Intro.	E,A,GP	Direct	Intro.	E,A,GP	Direct	Intro.	E,A,GP	
CSSD211	Introduction to Cloud Computing	3										Direct	Inter.	F,A,L,GP	Direct	Intro.	E,A						Direct	Intro.	E,A,GP	Direct	Intro.	E,A,GP	Direct	Intro.	E,A,GP	
FIN4620	Capital Markets and Trading	3	Direct	Adv.	E,GP	Relat.	Inter.	E,GP				Direct	Inter.	E,A,L,GP	Direct	Intro.	E,A						Direct	Intro.	E,A,GP	Direct	Intro.	E,A,GP	Direct	Intro.	E,A,GP	
CSSD3xxx	Web and Mobile Programming	3										Direct	Inter.	E,A,L,GP	Direct	Intro.	E,A						Direct	Intro.	E,A,GP	Direct	Intro.	E,A,GP	Direct	Intro.	E,A,GP	

Table 10. Curriculum Map.

Relationship Level:

Foundational (Found.): course does not address outcome directly but builds foundations for other courses that do, Related: course has a weaker relationship with the outcome, otherwise: the course is important for achievement of the outcome.

Content Level: Intro: introductory, Inter: intermediate, Adv: Advanced

Evaluation: E: Exams and Tests, A: Assignments, L: Lab Tests, (GP): (Group) Project, S: Essays and research papers, C: Cases

York University Quality Assurance Procedures (YUQAP) New Program Appraisal

External Appraisal Report on the Proposed New Bachelor of Science (BSc) in Financial Technologies York University, Markham Campus

Proposed launch in Fall 2023

Please provide feedback, as appropriate, on the evaluation criteria provided below.

External Reviewer(s)

Michael R. King, Associate Professor and Lansdowne Chair in Finance, Gustavson School of Business, University of Victoria

1. Outline of the Visit

- Who was interviewed?

Lyndon Martin, Vice Provost Academic,
Alice Pitt, Senior Advisor, Markham Academic Strategic Planning
John-Justin McMurtry, Dean, Liberal Arts and Professional Studies (LA&PS),
Sean Kheraj, Associate Dean Programs, (LA&PS)
Anita Lam, Associate Dean, Teaching and Learning (LA&PS)
Sotirios Liaskos, School Director/Associate Professor, School of Information Technology,
Zijiang Cynthia Yang, Undergraduate Program Director, School of Information Technology, Andrea Podhorsky, Assistant Professor, Dept. of Economics

- What facilities were seen

Due to COVID-19, meetings were held virtually over Zoom. I was given a PowerPoint document outlining the new Markham campus, as well as online links.

- Any other activities relevant to the appraisal

I received and reviewed the documents outlined below:

1. The program proposal brief.
2. The review template.
3. Slides introducing the Markham campus (including a clickable link to an overview video).
4. A draft of a proposed collegial governance structure for the campus.
5. A list and summaries of all programs to be offered at Markham.

I was also given links to the University Academic Plan, and the Markham Campus website:

<https://www.yorku.ca/uap2020-25/>

<https://www.yorku.ca/markham/>

In April 2020, I conducted a similar external review of a new graduate program at Queen's University, the Master of Financial Innovation and Technology (MFIT). I have one edited volume on the digital revolution in financial services, and a second sole-authored textbook forthcoming on Fintech (both with University of Toronto Press).¹

2- General Objectives of the Program

¹ <https://utorontopress.com/9781487506025/the-technological-revolution-in-financial-services/>

- Is/are the program name and degree designation(s) appropriate?

Yes, the program name and degree designation are appropriate given the integration of mathematics, computer programming / IT, finance and economics as well as specialized courses on financial technologies.

- For graduate programs that wish to have a Quality Council endorsed field(s), are the fields indicated in the proposal appropriate?

Not applicable for an undergraduate program.

- Are the general objectives of the program clear and are they consistent with University and Faculty missions and academic plans?

The proposal and features of this program have been designed to fit with York's University Academic Plan (UAP). The Markham campus will attract a broad sociodemographic of students. The proposed program is high quality. There has been considerable thought given to promoting research with a focus on intensive University that is committed to enhancing the well-being of the communities we serve. The location of this program at the Markham campus will fit with the strategic focus on three research clusters – Fintech, AI and society, and digital cultures. One of my suggestions below is to incorporate an entrepreneurship minor by allowing students to take courses offered by the Bachelor of Commerce in Entrepreneurship and Innovation Management.

The BSc Fintech is also a launching point for future graduate diplomas or degrees in fintech, AI and blockchain. Currently Queen's University is the main competitor, with a number of specialized professional Masters degrees on these topics.² These programs are driving revenues and growth at the Smith School of Business, providing a platform for attracting and hiring research faculty. Once research faculty are in place, it will be possible to attract PhD students to the Markham campus who are interested in working at the nexus of technology and financial services.

3. Need and Demand

- Is there sufficient explanation of need/demand for the program?

Yes, there is high demand for technologically-savvy graduates who understand financial services to work for incumbent financial institutions (banks, insurance, asset managers), related technology companies (IBM, enterprise software companies), and technology companies moving into financial services (BigTech). I have also suggested ways to better prepare interested students for entrepreneurial Fintech ventures.

The program is designed to train innovative, job-ready, and technologically skilled graduates for Toronto's financial services, Fintech, and Information and Communication Technology (ICT) sectors. There are growing job opportunities in these areas.

A key selling point and feature of this program will be incorporating cutting edge technology training into the curriculum, notably AI and machine learning, cybersecurity and digital identity, blockchain and distributed ledgers, big data analytics and visualization, and computer programming. My recommendation is to introduce more core finance courses and electives to ensure the graduates are financially-literate and job-ready for internships and full time positions in financial services. The current proposed curriculum is weak in this area.

The main competition is the Bachelor of Computing and Financial Management: (co-op) at University of Waterloo, which is stronger on accounting, finance and soft business skills but weaker on Fintech, data science, and blockchain. The complaint I hear from incumbent financial institutions (banks, asset managers, insurance companies) is that graduates do not have enough hard, technical skills. I think the current proposal has these

² https://smith.queensu.ca/grad_studies/index.php

technical skills but needs to provide more financial literacy and electives for soft skills (leadership, marketing, business development).

4. Program Content and Curriculum

- Does the curriculum reflect the current state of the discipline or area of study? If applicable, comment on the appropriateness of any unique curriculum or program innovations or creative components.

General Comments

As it stands, the BSc Fintech curriculum is great on Tech (computer programming, AI/ML, data analytics, blockchain and DLTs) but weak on Fin (financial intermediation, financial markets, investing and portfolio management, payments). On blockchain, the program should have a formal connection with York's Blockchain Hub <https://theblockchainhub.com/>

It is clear that the market (employers, students) is looking for more technical training. But the technical skills above are also taught in a computer science degree. The question, therefore, is why a “*BSc in Fintech*”? The message I have heard from Fintech ecosystem stakeholders is that programmers without knowledge of financial services present a challenge. Graduates need to have a basic literacy in financial services. If not, graduates may find that they need to attend a Masters of Finance or MFIT (i.e. both available from Queen's Smith School of Business).

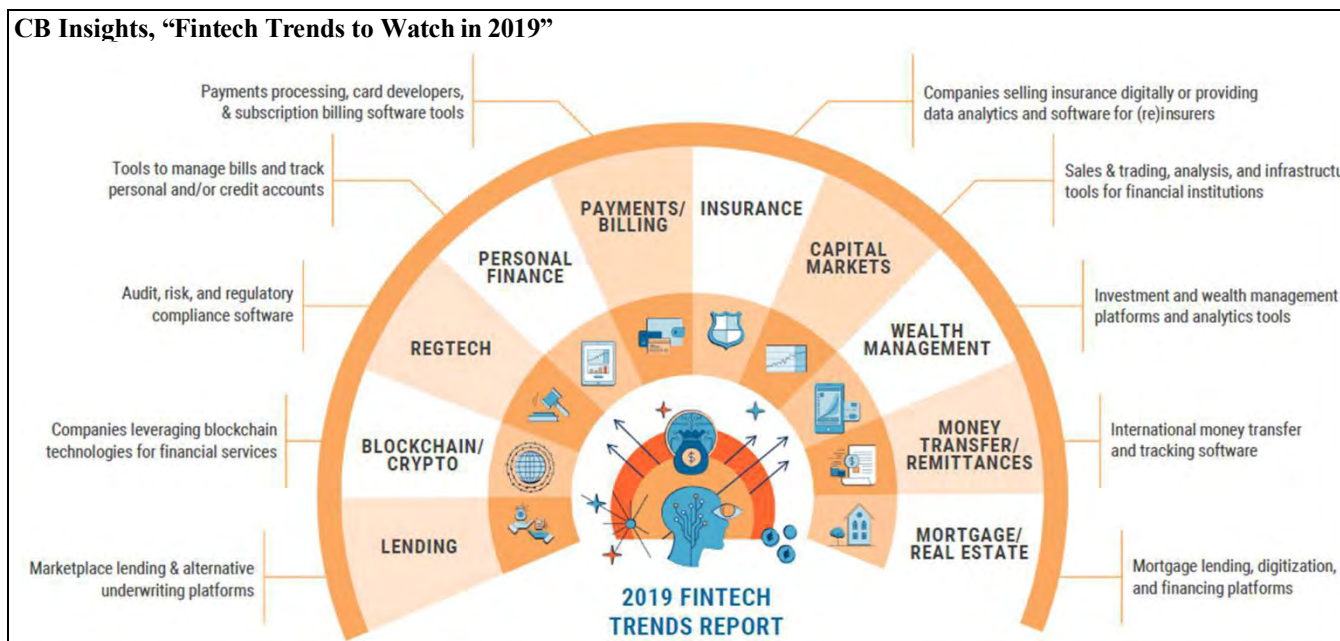
One solution is to ask employers. I recommend holding focus groups with a range of employers and a diversity of HR and recruiting teams (not simply the IT staff at banks). Given that students completing a 4 year BSc Fintech will have two internships in their 3rd and 4th year, the question to employers is what skills do they need to be employable. A great resource is the TFI 2020 Financial Services Talent Pipeline report available at: <https://tfi.ca/files/pages/TFI-FS-Talent-Pipeline-Report.pdf>

I also recommend that the BSc Fintech set up and consult with an Advisory Board. York likely has a larger body of alumni working in the GTA in financial services and ICT sectors. For example, the Queen's MFIT has an advisory board with 17 members with a variety of professions and backgrounds.³ Such an Advisory Board can certainly provide input on key skills that are lacking for entry-level hires in their organizations.

³ https://smith.queensu.ca/grad_studies/mfit/advisory_board.php

Detailed Curriculum Review

To provide context for my detailed suggestions, let’s take a look at three Fintech sources and see how many of these lines of business and skill sets are covered in the proposed curriculum: (i) CB Insights, the NY-based market intelligence firm, (ii) Toronto’s MaRS Fintech cluster, and (iii) York’s executive education course on Fintech.



This diagram divides Fintech into 10 business areas (or lines of business) – most which are mapped easily to areas and careers within financial services. The proposed curriculum covers “Blockchain/Crypto” (a new and growing area, which may be known as Decentralized Finance or DeFi), but does not adequately cover the lines of business. Is the intention to specialize in this one niche area?

MaRS Fintech Areas (<https://www.marsdd.com/our-sectors/Fintech/>)

1. **AI, data and analytics:** Machine learning tools to better engage with customers and increase revenue.
2. **Cybersecurity and digital identity:** Identity verification and safe transaction tools that protect personal information.
3. **Alternative finance:** Novel lending, credit, mortgage and investment tools for businesses and consumers.
4. **Insurance:** Technologies that are revolutionizing on-demand insurance and risk management.
5. **Online and mobile retail:** Tailored shopping solutions for on-the-go purchases and improved customer engagement experiences.
6. **Payments and remittance:** Cloud-based platforms and blockchain solutions that enable fast, secure payments anywhere in the world.

This division of Fintech features one area of tools (#1), and five business areas (#2-#6). The proposed curriculum covers the tools “AI, data and analytics” and the cyber portion of “Cybersecurity and digital identity”, but does not adequately cover the remaining business areas.

York Schulich School of Business Fintech Executive Education Course:

<https://seec.schulich.yorku.ca/program/the-Fintech-revolution-redefining-financial-services-in-the-age-of-disruption/details/>

Modules / Curriculum

1. **Redefining the Financial Services Landscape**
 - A completely digital ecosystem: digitized products, digital customer
 - Digital currency, mobile money
 - Intersection of core verticals
 - Disruptive waves: Plotting a course amidst uncertainty and COVID-19
2. **Rise of Payments & Point-of-Sale Lending**

- Role of shopping cart experience for payments
- Financing from bricks to clicks
- Incumbents and new entrants competing for the customer experience – winning strategies
- 3. Digital Banking**
 - Digital Hybrids and Digital Natives
 - Challenger or Neo-Bank examples
 - The move to Open Banking in Canada
 - Entry by the tech giants
- 4. InsurTech**
 - Insurtech redefining the industry; adoption by full carriers, distributors and enablers
 - Digital carriers and brokers, micro-insurers, on-demand and usage-based insurers, P2P insurers
- 5. E-commerce Transforming the Customer Experience Through Fintech**
 - Evaluating e-commerce partnerships
 - Strategies for winning combinations
 - Optimizing CX with data analytics
 - Social networks and the customer journey
 - AI and data analytics as competitive advantage
- 6. Crypto Currency and Blockchain**
 - Future applications of blockchain in Fintech
 - KYC/AML and the decentralized network
 - Cryptocurrency: roles of custodians, asset managers and settlement agencies
- 7. M&A in the Fintech Space**
 - Overcoming competitive barriers via acquisitions
 - Accelerating to dominance with consolidation
 - The case for partnership in Fintech

This course divides Fintech into 2 topics (landscape, M&A) and five business areas. Again, the current curriculum does not cover a significant portion of the topics taught in this course.

The proposed curriculum is below. I have underlined and bolded courses that are **REQUIRED**.

	Technology	Mathematics	Economics, Accounting & Finance	Fintech Integrative
1 st yr.	Introduction to Programming	Applied Calculus Linear Algebra Statistics	Microeconomic s Macroeconomic s	
2 nd yr.	Intermediate Programming Data Structures Management Information Systems	Elementary Probability Theory of Interest	Financial Accounting Management Accounting	Introduction to Fintech
3 rd yr.	Data and Knowledge Management Web Programming Operating Systems Networks & Distributed Systems Machine Learning for Finance	Models of Financial Economics	Finance Monetary Economics	Cases in Fintech
4 th yr.	Computer and Network Security Mobile Computing Software Engineering Advanced Topics in Machine Learning Data Visualization	Finance Operations Research for Finance		Blockchain Financial Cryptography Cryptoeconomic Capstone Fintech Project

Three things stands out from this table:

1. the lack of finance courses
2. the fact that no Finance course are **REQUIRED**, and
3. the absence of any courses in 4th year.

For a BSc in Fintech – my reaction was, “You’re kidding, right?”.

The proposed curriculum is excellent on technology skills. It is great to see the integration of AI, data analytics, cybersecurity, enterprise systems design and blockchain / distributed ledgers in the curriculum. It is also very important that graduates master Python and Java. They need to be exposed to Solidity, the programming language for the Ethereum blockchain. They also need to learn Matlab for AI/ML applications.

The proposed curriculum is not credible for a BSc Fintech. It will not provide the financial literacy required by financial sector employers. The goal should be to produce graduates who are prepared in to step into internships and careers in financial intermediaries and financial markets.

Economics, Accounting & Finance Courses

- Notice that the current proposal has a choice in 3rd year from two optional finance courses, *ADMS3530 Finance* course in 3rd year OR , *MATH2281 Models of Financial Economics* (taught by the Math department, so likely much more technically demanding). Both *Finance* and *Models of Financial Economics* should be required courses, with *ADMS3530* in 2nd year and *MATH2281* in 3rd year, respectively.
- Graduates will need a solid understanding of how financial institutions and financial markets operate. These topics are not covered in the proposed curriculum. Looking at the course descriptions, there is no mention of the valuation and trading of securities (equity, debt) and financial instruments (foreign exchange, derivatives). The only mention is *MATH 2280 Theory of Interest (Fixed Income)*, which is relevant for understanding bonds, but not for valuing and trading them. Much of Fintech focuses on banking, credit and risk management. The word “bank” or “banking” only appears once under any of the course descriptions. The same is true for terms “loan” and “risk management”. These are critical gaps in this curriculum.
- While not all students may want to go deeply into the financial side of Fintech, students should have the option to specialize through 4th year finance electives: (i) investing and portfolio management, (ii) derivatives and risk management, (iii) corporate finance and capital markets, and (iv) algorithmic trading. For examples of course descriptions, see these courses offered by Waterloo’s Bachelor of Computing and Financial Management⁴, Queen’s MFIT⁵ or Columbia Business School’s Fintech electives.⁶
- The current proposal has two accounting courses, when only one is required. Students need to understand financial statements and relationships, which is covered in *ADMS 2500 Financial Accounting*. But Fintech students do not need to be accountants. Drop *ADMS2510 Introduction to Management Accounting*.
- The current proposal has three economics courses: Micro and Macro in first year, and Monetary Economics in 3rd year. This suggestion is based on teaching the same courses for the BSc Fintech that are required for an Bachelors of Arts in Economics. Economics is valuable for any undergraduate degree but Fintech is not an economics profession. The only slice of Fintech that is economics heavy is the cryptocurrency and cryptoassets field, which is only one of a dozen areas under Fintech (despite the massive speculation in Bitcoin and Altcoins). Students need one

⁴ <https://ugradcalendar.uwaterloo.ca/page/ARTS-BCFM-Overview-and-Degree-Requirements>

⁵ https://smith.queensu.ca/grad_studies/mfit/program-details/index.php

⁶ <https://www8.gsb.columbia.edu/Fintech/fincourses>

Introduction to Economics course (covering both macro and micro) in first year. The Monetary Policy course is mislabeled, because what is needed is a course on Financial Intermediation, focusing on banking, insurance, payments, financial markets, and regulation. As a former central banker, monetary policy is too narrow and specialized for this level of student targeting Fintech. Financial intermediation and banking are critical. I recommend replacing *Monetary Economics* with a course on *Financial Markets and Financial Intermediation* as a required 3rd year course.

Technology

- Cybersecurity is the biggest operational risk facing financial services, and a key distinguishing feature of this course. Currently there is a required course in 3rd year (FINT 3510 Computer and Network Security). It is not clear that this course incorporates digital identity, but it should.
- I would recommend adding a 4th year elective course in the area of cybersecurity and/or digital identity if possible.

Fintech Integrative

- I do not see how you can teach an *FINT2010 Intro to Financial Technologies* in 2nd year without introducing *Finance* first. (Imagine teaching *Environmental Biology* before *Introduction to Biology*).
- *FINT 2010 Introduction to Financial Technologies* does not appear to be well thought out. Students do not need more than 15 minutes on the history of calculators and transaction ledgers, and maybe 20 minutes on the history of money. What they need to understand is the Fintech landscape, the lines of businesses, the business models, and the technologies.
- There are two required blockchain courses in 4th year (**FINT 4720 Financial Cryptography and Blockchain**, **FINT 4730 Cryptoeconomics**). I recommend making the former FINT 4720 a required 3rd year course, then offer the latter FINT 4730 as a 4th year elective for students who wish to specialize in crypto. Despite the hype, not all Fintech students will want to specialize in crypto. We need to recognize that crypto is only one application of blockchain and distributed ledger technology (DLT), but by no means the only one. A payments app can use DLT without requiring cryptocurrencies as the means of payment. See the [R3 Corda platform](#) for a live business example of a private, permissioned distributed ledger for financial services.
- Students specializing in crypto need an elective on Ethereum and Decentralized Finance (DeFi), as well as practice with the programming language Solidity. DeFi is the most promising growth area for decentralized financial markets, but it will likely co-exist alongside the traditional financial infrastructure for decades to come.
- **FINT 4000 Capstone Project in Fintech** is a valuable addition to the course. I would recommend broadening it to include development of a mobile app, or business plan for a Fintech startup

The proposed curriculum does not provide entrepreneurship training for students interested in founding or working in a Fintech startup. Students should have the ability to incorporate an entrepreneurship minor by allowing students to take courses offered by the Bachelor of Commerce in Entrepreneurship and Innovation Management. I would also recommend building connections with: York's YSpace Innovation Hub (<https://yspace.yorku.ca/>). I would also recommend building relationships with stakeholders in the Fintech ecosystem: incubators & accelerators (University of Waterloo & Velocity / Communitech), Ontario Centre of Innovation (formerly Ontario Centres of Excellence), Rotman's [Creative Destruction Lab](#) (Prof. Francesco Bova), and [MaRS Fintech](#) (Michelle Peng Greenberg).

I recommend incorporating a hackathon into the curriculum as an experiential component. Hackathons are great learning environments for students, and recruiting fairs for employers. York could partner with a third party, such as Hackergal (<https://hackergal.org/>), Waterloo's Hack The North (<https://hackthenorth.com/>) or Western University's HackWestern (<https://www.hackwestern.com/>).

- For undergraduate programs, comment on the appropriateness of the anticipated class sizes. For graduate programs, is there adequate evidence that each graduate student in the program will take a minimum of two-thirds of the course requirements from among graduate level courses?

Class sizes in 1st & 2nd year are reasonable, 3rd year is not mentioned (except labs capped at 35), and 4th year seems too small at 20.

5. Program Structure, Learning Outcomes and Assessment

- Are the program requirements and learning outcomes clear, appropriate and in alignment with the relevant degree level expectations?

The Program Requirements are laid out clearly, but I have suggested changes on which courses to include and what should be required vs. optional – see above.

The Learning Outcomes in “5.1.a) Program Level Outcomes” are very computer science focused. There is no mention of finance at all.

- Comment on the appropriateness of the program curriculum and structure to support the program learning outcomes. For undergraduate programs, comment on the nature and suitability of students' final-year academic achievement in the program.

I recommend removing a 3-year BSc option with 90 credits. This option will dilute the BSc Fintech degree and confuse employers who will not understand the difference between a 3-year BSc and 4-year BSc honours. The 3-year degree as proposed will not have sufficient finance and Fintech to deserve the Fintech title – instead I recommend giving students who exit at this point a BSc in Computer Science. Employers in financial services will expect students to have 4 years of undergraduate education with the corresponding credits and internships. To be credible and successful, students will need at least two internships. They will also need to specialize by choosing among the advanced 4th year electives.

- Are the methods and criteria for assessing student achievement of learning outcomes and documenting those are appropriate and effective?

The forms of assessment are appropriate and effective, namely: Exams and Tests (E), Assignments (A), Labs Tests (L), Group Project (GP), Essays and research papers (S).

- Comment on the appropriateness of the proposed mode(s) of delivery to meet the program learning outcomes.

I like the modes of delivery described in the proposal: the flipped classroom, blended teaching, and in- person.

- Comment on the appropriateness of the experiential education component of the program, if applicable.

Experiential learning, combined with internships / work placements, will be a key success factor for this program. This feature will not only mirror the requirements at competitor schools (Waterloo), but they will provide invaluable learning opportunities that allow students to put into practice the skills and knowledge they develop in the program.

The proposal says the program will be part-time student friendly, targeting both local first-degree students and professionals in the Markham area interested in entering Fintech.

6. Admission Requirements

- Are the admission requirements appropriately aligned with the program learning outcomes?
- Is there sufficient explanation of any alternative requirements, if any, for admission into an undergraduate, graduate or second-entry program, such as minimum grade point average, additional languages or portfolios, along with how the program recognizes prior work or learning experience?

I found the admission requirements to be appropriate with sufficient explanation.

7. Resources

For all programs

- Adequacy of the administrative unit's planned utilization of existing human, physical and financial resources, and any institutional commitment to supplement those resources, to support the program.

There were no support statements in the proposal from the relevant Dean(s)/Principal, with respect to the adequacy of existing human (administrative and faculty), physical and financial resources necessary to support the program.

- Appropriateness of the collective faculty expertise to contribute substantively to the program.

There were no faculty listed in my version of the proposal. The faculty member at York's Schulich School of Business who is leading on fintech is Professor Pauline Shum (<https://schulich.yorku.ca/faculty/pauline-m-shum/>). Pauline is the founder of a fintech startup in the wealth management space called Wealthscope (<https://www.wealthscope.ca/>). She would know whom to approach in the GTA with fintech expertise.

York has expertise on blockchain, evidenced by the Blockchain Hub <https://theblockchainhub.com/>

- Participation of a sufficient number and quality of faculty who are competent to teach and/or supervise in the program, including qualifications, research, innovation and scholarly record.

There were no faculty listed in my version of the proposal.

- Evidence that there are adequate resources (e.g. library, laboratory, studio space, equipment) to sustain the quality of scholarship produced by undergraduate students as well as graduate students' scholarship and research activities.

The Markham campus proposal shows more than adequate shared resources for this degree. Students will have a first-class experience.

Additional criteria for undergraduate programs only

- Evidence of and planning for adequate numbers and quality of: (a) faculty and staff to achieve the goals of the program; or (b) of plans and the commitment to provide the necessary resources in step with the implementation of the program; (c) planned/anticipated class sizes; (d) provision of supervision of experiential learning opportunities (if required); and (e) the role of adjunct and contract faculty.

The program has outlined anticipated class sizes and the growth in enrolment over time. These projections are achievable, as there will be high demand both domestically and internationally.

The big gap in the proposal at this point in staffing. These sections were blank in the proposal: 7.1 Faculty, 7.2 Contract and retired faculty, 10. Curricula Vitae of the Faculty. It will be particularly difficult to hire faculty to teach the Fintech Integrative courses. In Canada, there are only a handful of finance faculty with Associate Professor or Professor level who are researching and teaching fintech. Most of the innovative work is coming from Assistant Professors and recent PhD graduates. Many top schools are looking to hire these faculty.

In the interim, York will need to rely on (i) faculty from other schools at York, (ii) adjunct or visiting faculty from other universities, and (iii) lecturers and professionals who teach specific courses (such as the two instructors from York's Executive Education program on Fintech, Jerome Dwight and Brian Metcalf.⁷ As the program evolves, hiring should target the two largest annual finance recruiting conferences: the Financial Management Association each October, and the American Finance Association each January (part of the ASSA meetings). Job ads should be advertised on SSRN FEN Job Openings.⁸

The research cluster at Markham and the future potential for graduate teaching (professional Masters degrees, PhD program) will be important incentives for attracting both established faculty and new hires off the job market.

8. Quality of Student Experience

- Is the evidence of a program structure and faculty research that will ensure the intellectual quality of the student experience?

The MSc Fintech will be intellectually rich and demanding for students. It will be a great designation and preparation for careers in financial services and ICT in the Greater Toronto Area and across Canada. I am confident that the students will have an excellent experience, given the interdisciplinary curriculum, the learning methods, the internships and experiential learning, the research clusters (Fintech, AI, digital cultures) and brand new the facilities of the Markham campus.

Note: Reviews are urged to avoid using references to individuals. Rather, they are asked to assess the ability of the faculty as a whole to deliver the program and to comment on the appropriateness of each of the areas/fields of the program that the university has chosen to emphasize, in view of the expertise and scholarly productivity of the faculty.

9. Other Issues

10. Summary and Recommendations (*Note: The responsibility for arriving at a recommendation on the final classification of the program belongs to the Appraisal Committee of Quality Council. Individual reviewers are asked to refrain from making recommendations in this respect.*)

The proposed Bachelor of Science (BSc) in Financial Technologies at York's Markham campus is a timely, high profile and marketable addition to undergraduate education in Canada. It targets an important growth area at the nexus of computer programming, financial services, information and communication technologies, and entrepreneurship. The technology focus integrating AI and machine learning, cybersecurity and digital identity, blockchain and distributed ledgers, big data analytics and visualization, and computer programming will be very attractive.

My main recommendations are to incorporate more required and elective finance courses into the curriculum, while dropping proposed courses that are not integral to fintech (advanced accounting and economics). To be financially literate and job-ready, graduates will need a solid understanding of how

⁷ <https://seec.schulich.yorku.ca/program/the-fintech-revolution-redefining-financial-services-in-the-age-of-disruption/details/>

⁸ <https://www.fma.org/for-job-seekers> ; <https://careers.afajof.org/jobs/> ; <https://www.ssrn.com/index.cfm/en/janda/job-openings/?jobsNet=203>.

financial institutions and financial markets operate. These topics are not covered in the proposed curriculum. I also recommend including the opportunity for an entrepreneurship minor with the proposed BCom, Entrepreneurship and Innovation Management.

To get feedback on the final curriculum, I recommend holding focus groups with employers targeted for internships, being careful to consider all sides of the business. I also suggest constituting an Advisory Board of York alumni working in relevant fields to gain their insights and feedback. The success of the program will be judged by the availability of student internships and success in securing full-time employment upon graduation.

A key challenge is adequately staffing this program with qualified faculty and part-time lecturers. Attracting fintech faculty will be a multi-year effort that will involve delivering on the research cluster opportunities while holding out the possible expansion in the future into graduate and PhD programs.

**York University Quality Assurance Procedures (YUQAP) New
Program Appraisal**

**External Appraisal Report on the Proposed New
Bachelor of Science (BSc) in Financial Technologies York
University, Markham Campus
Proposed launch in Fall 2023**

External Reviewer:

Michael R. King, Associate Professor and Lansdowne Chair in Finance, Gustavson School of Business, University of Victoria

I have received and reviewed the revised program proposal for the **LA&PS Honours Bachelor of Science- Financial Technologies** (February 2022)). This 135-page proposal contains my initial appraisal report (from September 2021), the Response to the External Reviewer's Recommendations (from January 2022). It also contains two sets of documents missing in the original proposal: (i) the CVs of faculty and (ii) the letters of support from other faculties.

I find that the main recommendations in my September 2021 appraisal have all been addressed in this revised proposal. In my opinion, the BSc Fintech curriculum is much improved. Below, I highlight the recommendations from my appraisal *in italics* and how they have been addressed.

I see that my feedback has been taken seriously and 95% of my suggestions have been addressed. My only remaining suggestion is to consider offering an introductory finance course in 2nd year. The original proposal included *ADMS 3530 Finance* as a 3rd year elective, but it has been dropped. No doubt staffing is an issue. If that is the case, one the solution may be to allow BSc Fintech students to take this course at Schulich School of Business (or have it taught by an adjunct).

I would be happy to discuss any of these points and wish you success with this program.

Best,

Michael R King PhD CFA
Lansdowne Chair in Finance
Gustavson School of Business, UVic
michaelking@uvic.ca
c:(250) 530-9015

Below, I highlight the recommendations from my appraisal *in bullet and italics* and how they have been addressed.

3-year Option

- *Remove a 3-year BSc option with 90 credits. This option will dilute the BSc Fintech degree and confuse employers.*

The revised proposal does not mention of 90-credit 3-year BSc. I assume it has been dropped?

Curriculum Design

- *The original BSc Fintech curriculum is weak on financial intermediation, financial markets, investing and portfolio management, payments. Introduce more core finance courses and electives to ensure the graduates are financially-literate and job-ready for positions in financial services. Add these topics to the curriculum: alternative finance (lending and investment tools), insurance / insurtech, digital banking, payments and point of sale lending, and e-commerce.*

Four courses have been added to strengthen the finance component of the proposed program – two core (MATH3285 – Quantitative Finance, FINT3620 – Financial Intermediation and Banking) and two electives (FINT3630 – Investment Management, FINT4620 – Capital Markets and Trading). One elective course is now mandatory (MATH2281 – Models of Financial Economics).

Oddly, ADMS 3530 Finance – which I see as introductory finance – has been dropped.

Finance, Economics, & Accounting

- *Incorporate more required and elective finance courses into the curriculum, while dropping proposed courses that are not integral to fintech (advanced accounting and economics).*

DONE

- *ADMS3530 Finance should be a required course in 2nd year and MATH2281 Models of Financial Economics required in 3rd year, respectively.*
- *I do not see how you can teach an FINT2010 Intro to Financial Technologies in 2nd year without introducing basic finance concepts first.*

ADMS 3530 Finance has been dropped. This was the only introductory finance course, and was formerly listed as a 3rd year elective. I think it is a mistake not to have an introductory finance course in 2nd year.

MATH2281 is now mandatory in 2nd year.

- *Graduates will need a solid understanding of how financial institutions and financial markets operate. Replace Monetary Economics with a course on Financial Markets and Financial Intermediation as a required 3rd year course.*

DONE (added FINT3620)

- *Students should have the option to specialize through 4th year finance electives: (i) investing and portfolio management, (ii) derivatives and risk management, (iii) corporate finance and capital markets, and (iv) algorithmic trading.*

DONE (FINT3630, FINT4620)

- *Drop ADMS2510 Introduction to Management Accounting.*

DONE

Fintech Integrative / Technology

- *FINT 2010 Introduction to Financial Technologies does not appear to be well thought out.*

The FINT 2010 course description is much improved.

- *Make FINT 4720 Financial Cryptography and Blockchain a required 3rd year course, then offer the latter FINT 4730 Cryptoeconomics as a 4th year elective for students who wish to specialize in crypto.*

DONE. FINT4730 is also a required 4th course.

- *Add an elective on Ethereum and Decentralized Finance (DeFi), as well as practice with the programming language Solidity.*

FINT4730 Financial Cryptography and Blockchain will cover the foundations of smart contract languages such as Solidity (Ethereum) or Chaincode (HL Fabric)

- *Develop a formal connection with York's Blockchain Hub <https://theblockchainhub.com/>*

DONE

- *Add a 4th year elective course in the area of cybersecurity and/or digital identity.*

DONE. By taking CSSD3221 *Network Security* as elective, students fulfill the prerequisite to study cybersecurity more deeply by dedicating 6.0 of their non-major credits for taking any or both: CSSD3121 *Information Systems Forensics*, CSSD4221 *Vulnerability Detection*. The program will cover aspects of digital identity in *FINT4730 Financial Cryptography and Blockchain*.

Entrepreneurship / Business

- *Include the opportunity for an entrepreneurship minor with the proposed BCom, Entrepreneurship and Innovation Management. Incorporate a hackathon into the curriculum as an experiential component.*

DONE. There is a strong entrepreneurship connection with a number of electives. There is discussion about introducing a major/minor configuration, whereby students can major in FinTech and minor in Entrepreneurship, with mention in the letter of support from the School of Administrative Studies.

- *Build connections with York's YSpace Innovation Hub and stakeholders in the Fintech ecosystem.*

There is no explicit mention of these connections. But I see mention of interaction with ecosystem partners in *ENTP4945 Technology Entrepreneurship*. I recommend pursuing this more broadly.

- *Broaden FINT 4000 Capstone Project in Fintech to include development of a mobile app, or business plan for a Fintech startup*

While there is no explicit specific mention of mobile apps or startups for *FINT4000 Capstone Project*, I see this as a possibility with the entrepreneurship courses. I also see mention that interested students can pursue a smart-contract-based project in this capstone course.

Support Statements

- *There were no support statements in the proposal from the relevant Dean(s)/Principal, with respect to the adequacy of existing human (administrative and faculty), physical and financial resources necessary to support the program.*

I see letters of support from: Department of Economics, School of Administrative Studies, Department of Mathematics and Statistics, Schulich School of Business and York University Libraries.

I encourage the BSc Fintech faculty to follow up on this offer in the letter from Schulich: "We would welcome discussion as to whether Schulich undergraduate students might consider fulfilling their degree requirement of non-Schulich courses through enrolment in courses in this program as well as the idea of opening some seats in our undergraduate courses for your students."

Faculty & Staffing

- *The big gap in the original proposal was staffing. There were no faculty listed. It will be particularly difficult to hire faculty to teach the Fintech Integrative courses. In the interim, York will need to rely on (i) faculty from other schools at York, (ii) adjunct or visiting faculty from other universities, and (iii) lecturers and professionals who teach specific courses. Attracting fintech faculty will be a multi-year effort that will involve delivering on the research cluster opportunities while holding out the possible expansion in the future into graduate and PhD programs.*

I see CVs from five faculty who will be teaching on the program. These faculty have complimentary skills. I note that two faculty (Chris Robinson, Gary Spraakman) are emeritus, which is no doubt an interim solution until more recruiting takes place in future.

Staffing will always be a challenge, as it is with every Canadian university in this specialized space.

Advisory Board & Outreach

- *Set up and consult with an Advisory Board*

The revised proposal states "The formation of an industry advisory board is indeed a part of our agenda".

- *Hold focus groups with a range of employers and a diversity of HR and recruiting teams (not simply the IT staff at banks).*

I see this reference in the proposal: “Through social media and events, the program shall maintain strong alumni relations, engaging alumni and their employers regularly to assess whether the set POs are accomplished or require curricular re-alignment or even an update of the POs themselves. The evidence acquisition would include polling (surveys) and focus groups, involving self-reported assessments from participants.”

Bachelor of Science in Financial Technologies

Responses to the External Reviewer’s Recommendations and Summary of Changes to the BSc Program

Contents

Second Round	1
First Round	2

Second Round

Updated: March, 2022

We would like to thank again the external reviewer for his thorough examination of our updates. We append this short note to our original report to describe how we have further updated the proposal to reflect the Reviewer’s March 29th updated letter.

- **3rd Year Option.** The 3-year option has indeed been dropped as per the reviewer’s recommendation.
- **Finance Course.** As per the reviewer’s suggestion, *ADMS3530-Finance* has been reinstated as an alternative to the math-heavy *MATH3285-Quantitative Finance*.
- **Finance Course vis-à-vis FinTech Course.** We found the recommendation that a finance course is taken before the *Introduction to Financial Technologies* course difficult to implement. The needed prerequisite structure of any of the available finance courses necessitates its placement at the 4th term of the program the earliest. This means that the *FINT2010 - Introduction to Financial Technologies* must then be moved to the third year the earliest. However, it would not be optimal that FinTech students are given an overview to the subject of their studies only after spending 2 years in the program.. To address the concern, we hence design *ITEC2010* to offer a birds-eye-view of the field (what the financial services industry does and how it computerises it) that we believe is possible without a deep understanding of Finance and its techniques – aspects of which are introduced in this course as needed.
- **Capstone Content.** The description of possible projects now includes mobile apps, start-up business plans, and DeFi apps (typically involving smart contracts).

First Round

Updated: January, 2022

We are grateful to the external reviewer for his detailed and insightful report. We herein discuss the steps that have been taken to improve the proposal according to his recommendations. We specifically address how we have strengthened the finance component of the program proposal, how we have integrated an entrepreneurship component and related partnership opportunities, as well as how we have responded to other miscellaneous comments and suggestions made in the review.

Strengthening of the Finance Aspect

While finance is taught in an integrated and interdisciplinary manner throughout the program, we have revised the proposal to substantially increase the discernable finance content as per the reviewer's recommendations. Specifically:

- **Four (4) courses** have been added to strengthen the finance component of the proposed program as follows:
 - **[CORE] MATH3285 – Quantitative Finance**, developed specifically for FinTech Students, offers a thorough technical treatment of the basic financial objects and instruments and their valuation.
 - **MATH2281 – Models of Financial Economics** has now become mandatory.
 - **[CORE] FINT3620 – Financial Intermediation and Banking** describes the function, structure and management of modern banks and financial institutions from a financial perspective.
 - **[ELECTIVE] FINT3630 – Investment Management** focusses on the theoretical and applied aspects of portfolio management and optimization, with a focus on the use of computational methods to construct optimal portfolios. The course will also cover client behavior and ethics.
 - **[ELECTIVE] FINT4620 – Capital Markets and Trading** builds on **FINT2010 – Introduction to Financial Technologies** with more depth on how capital markets are structured and supported by technology.
- The descriptions of the following courses have been updated:
 - **FINT2010 – Introduction to Financial Technologies**, takes a non-technical bird's-eye view of the financial services industry and how it is supported by technology. The course covers most of the areas identified in the review including banking and related services (cash management, lending, mortgages and debt collection, payments and money transfers, trading and finance services, advising), treasury and foreign exchange, financial markets (capital markets, exchange and execution, intermediaries, algorithmic trading), insurance as well as cross-cutting concerns including customer relationship management, security, risk management and regulatory compliance.
The material is covered at a level appropriate for a second year course, with more

depth and advanced topics - particularly on capital markets - offered in **FINT4620 – Capital Markets and Trading Systems** and, depending on the choice of project, **FINT4000 – Capstone Project**.

- **FINT4720 – Payment Systems and Cryptocurrencies**, which starts by describing the architecture of the payment systems in North America, followed by a high-level introduction to cryptocurrencies as a means for storing and exchanging value.
 - **FINT4730 – Financial Cryptography and Blockchain** now follows up **FINT4720** by offering an introduction to cryptography as it applies to the financial domain and also introduces some technical aspects of cryptocurrencies including an introduction to smart contracts.
- The following courses have been dropped, following the recommendations:
 - **Management Accounting**.
 - **Monetary Economics**.

These changes are reflected in the updated curriculum and its mapping to program outcomes (POs). We note here that we view finance, mathematics and computing as foundational to attain the FinTech POs. Our graduates are meant to acquire a necessary part of the competencies, rather than the full breadth, for each of these subjects. As such, we feel that the original POs and their focus on financial technology adequately cover the goals of the program. Nevertheless, references to economics specifically have been removed, as the program does not have the economics orientation originally planned.

Entrepreneurship

The proposed program strongly focusses on developing technical skills, which may be applied in an entrepreneurial environment.

When desired, broader entrepreneurship education can be acquired by taking courses that are part the **BCom in Entrepreneurship and Innovation**, proposed for Markham Campus in parallel to this program. To facilitate this, we have added the following course as an elective:

- **ENTP4945 – Technology Entrepreneurship**

To be able to take this course, students can dedicate two of their three non-major courses by taking the following prerequisites:

- **[non-major] ENTP2920 – Innovation and Creativity**
- **[non-major] ADMS3920 – New Venture and Small Business Management**

The third non-major course could be any of the following courses according to the course progression map of the BCom in Entrepreneurship and Innovation proposal:

- **ENTP3990 – Hackathon I**
- **ENTP3950 – Social Entrepreneurship**
- **ENTP3995 – Independent Study in Entrepreneurship**
- **ENTP4960 – Principles of Entrepreneurship: Field Project**

- **ENTP4599 – Entrepreneurial Finance**

In the future, we will explore whether we can offer a version of **ENTP3990 – Hackathon** that pertains to FinTech problems and tools.

The above can offer to students of the BSc program a strong understanding of the relevant aspects of entrepreneurship, while maintaining a focus on financial technology throughout their studies. The relationship between the BSc Financial Technologies and the BCom in Entrepreneurship and Innovation can further be deepened in the future through the introduction of a major/minor configuration, whereby students can major in FinTech and minor in Entrepreneurship.

Furthermore, the proposed BSc aspires to build strong ties with the **The BlockchainHub** at York University as follows:

- All senior FinTech students will be fully qualified to take the blockchain certification courses offered by The BlockchainHub if they desire to become trained in specific networks, tools and languages including Ethereum/Solidity, Hyperledger Fabric and EOS. The BSc core courses will offer excellent theoretical foundations for students to master the tools taught in these courses.
- The BlockchainHub also offers an excellent context in which blockchain-specific capstone projects with an entrepreneurial vision can be executed. Specifically, the incubation environment of The BlockchainHub's C-Lab is a natural place in which students' ideas could be developed into marketable products and services.

Other curriculum updates and clarifications

- As discussed above, the content of **FINT2010 – Introduction to Financial Technologies** has been updated to reflect the need for greater introductory Finance content. We believe that it is important that students are offered a survey of the areas comprising the broad field of financial technology no later than the 2nd year of their studies, which will guide them in choosing future electives. Students will deepen their understanding of the role of banks and financial intermediaries in the economy in **FINT3620 – Financial Intermediation and Banking** and how capital markets work in **FINT4620 – Capital Markets and Trading**.
- The proposal continues to maintain separate introductory courses for micro- and macroeconomics to ensure that students have a foundational understanding of how markets work, prior to focussing on financial institutions and services. Also, since both of these courses are prerequisites for third-year economics courses, these courses will permit greater choice among electives and will open more academic pathways.
- The program has also been updated to allow deeper specialization into **Security** and **Cloud Computing** through participation to the **BSc in Computer Science in Software Development (CSSD)**, proposed for Markham in parallel to this program. Specifically, a number of CSSD courses have been added as electives (**CSSD2221 – Intro to Security Threats** being required), constituting a foundation on which strategic choice of non-major credits from CSSD can offer stronger specialization into those two areas.

- The program will cover aspects of digital identity in **FINT4730 - Financial Cryptography and Blockchain**. Further, it will cover the foundations of smart contract languages such as Solidity (Ethereum) or Chaincode (HL Fabric) in **FINT4730**. High-assurance software engineering in these languages is covered in **FINT4230 – Software Quality Assurance** and interested students can pursue a smart-contract-based project in **FINT4000 – Capstone Project**.
 - Additional tool-specific training can be acquired through **The BlockchainHub’s** many certification courses, as described above.
- The formation of an **industry advisory board** is indeed a part of our agenda to further develop, enrich and ensure the relevance of the BSc in Financial Technologies program.

Summary

We again want to thank the reviewer for their frank and thorough comments and recommendations, which we believe we have now addressed and adopted as best possible. We have added a substantial number of core and elective finance courses, created an entrepreneurship component, and have taken additional measures to ensure that graduates are financially literate and job-ready for internships and full-time positions in the financial services industry. Finally, the program proposal now outlines opportunities for future growth (e.g. sister BCom and BA programs), which we hope will exploit whatever opportunities for FinTech education this program leaves unexplored.

April 4, 2022

Professor Sotirios Liaskos
School of Information Technology
3051 Victor Phillip Dahdaleh Building

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Dear Associate Professor Liaskos:

Re: Decanal Support for the Honours Bachelor of Science- Financial
Technologies Proposal

I am pleased to provide you with a letter of support for the Honours Bachelor of Science in Financial Technologies proposal for a new degree to be housed in the School of Information Technology within LA&PS.

The proposed program aligns closely to the priorities and principles outlined in the University Academic Plan, 2020-25. First, in creating a professional degree program that combines hands-on technical training in the rapidly expanding financial services and banking sectors with the conceptual, mathematical, and methodological knowledge of a university education, the proposed program meets several goals under the UAP priorities “21st century learning” and “working in partnership,” including: to “continually reinvent our programs to address emerging issues and labour market needs that call for new pedagogical approaches and cross-disciplinary thinking;” to “build essential twenty-first century skills into our programs, including digital fluencies, information literacies, critical thinking, and the ability to ask good questions, marshal evidence, and communicate effectively across varied media;” and, to connect “our entrepreneurship and innovation activities to the broader innovation ecosystem of Ontario.”

The proposed program also aligns to the Faculty of Liberal Arts & Professional Studies Academic Plan, 2021-26. By proposing to develop an internship opportunity for students in a multi-disciplinary program with course offerings from the School of Information Technology, the School of Administrative Studies, the Faculty of Science, and the Department of Economics to be offered at Markham Campus, the proposal aligns to the following points under principle two and principle four: to “promote collaborations with Toronto, Peel Region, and York Region (including Markham) to make a positive local impact on the communities we serve;” to “promote and support curricular and pedagogical innovation across all units and all levels of study, with particular attention to the first-year experience and experiential learning opportunities for students in all programs;” and, to “support opportunities for professional development and curricular collaboration, where colleagues from different units can advance their skills and work together on options to enhance student engagement.”



By, preparing students for further study and employment in one of Ontario's fastest expanding labour markets, the proposed program also aligns to the point in SMA 3 that York University has "expanded our program offerings in areas of increasing need in Ontario- health sciences, engineering, computer science and technology, digital media and business and professional programs" (from the graduate employment rate in a related field metric). The designation of the program as an Honours Bachelor of Science provides the necessary curricular structure to ensure that the academic programming is both specific and nimble enough to adequately prepare students for career paths in engineering, computer science and technology, digital media, and business and professional contexts, which are constantly changing.

In response both the 1st and 2nd Reviewer's report, the program has added a substantial number of core and elective finance courses, created an entrepreneurship component, and have taken additional measures to ensure that graduates are financially literate and job-ready for internships and full-time positions in the financial services industry. Finally, the program proposal now outlines opportunities for future growth (e.g., sister BCom and BA programs), which we hope will exploit whatever opportunities for FinTech education this program leaves unexplored.

Recommendation 1-Strengthening of the Finance Aspect:

While finance is taught in an integrated and interdisciplinary manner throughout the program, we have revised the proposal to substantially increase the discernable finance content as per the reviewer's recommendations.

Specifically:

Four (4) courses have been added to strengthen the finance component of the proposed program as follows:

[CORE] MATH3285 – Quantitative Finance, developed specifically for FinTech Students, offers a thorough technical treatment of the basic financial objects and instruments and their valuation.

MATH2281 – Models of Financial Economics has now become mandatory.

[CORE] FINT3620 – Financial Intermediation and Banking describes the function, structure and management of modern banks and financial institutions from a financial perspective.

[ELECTIVE] FINT3630 – Investment Management focusses on the theoretical and applied aspects of portfolio management and optimization, with a focus on the use of computational methods to construct optimal portfolios. The course will also cover client behavior and ethics.

[ELECTIVE] FINT4620 – Capital Markets and Trading builds on FINT2010 – Introduction to Financial Technologies with more depth on how capital markets are structured and supported by technology.

The descriptions of the following courses have been updated:

FINT2010 – Introduction to Financial Technologies, takes a non-technical bird's-eye view of the financial services industry and how it is supported by technology. The course covers most of the areas identified in the review including banking and related services (cash management, lending, mortgages and debt collection, payments and money transfers, trading and finance services, advising), treasury and foreign exchange, financial markets (capital markets, exchange and execution, intermediaries, algorithmic trading), insurance as well as cross-cutting concerns including customer relationship management, security, risk management and regulatory compliance. The material is covered at a level appropriate for a second year course, with more depth and advanced topics - particularly on capital markets - offered in FINT4620 – Capital Markets and Trading Systems and, depending on the choice of project, FINT4000 – Capstone Project.

FINT4720 – Payment Systems and Cryptocurrencies, which starts by describing the architecture of the payment systems in North America, followed by a high-level introduction to cryptocurrencies as a means for storing and exchanging value.

FINT4730 – Financial Cryptography and Blockchain now follows up FINT4720 by offering an introduction to cryptography as it applies to the financial domain and also introduces some technical aspects of cryptocurrencies including an introduction to smart contracts.

The following courses have been dropped, following the recommendations:

Management Accounting.

Monetary Economics.

These changes are reflected in the updated curriculum and its mapping to program outcomes (POs). We note here that we view finance, mathematics and computing as foundational to attain the FinTech POs. Our graduates are meant to acquire a necessary part of the competencies, rather than the full breadth, for each of these subjects. As such, we feel that the original POs and their focus on financial technology adequately cover the goals of the program. Nevertheless, references to economics specifically have been removed, as the program does not have the economics orientation originally planned.

Recommendation 2 -Entrepreneurship:

The proposed program strongly focusses on developing technical skills, which may be applied in an entrepreneurial environment.

When desired, broader entrepreneurship education can be acquired by taking courses that are part the BCom in Entrepreneurship and Innovation, proposed for Markham Campus in parallel to this program. To facilitate this, we have

added the following course as an elective:

ENTP4945 – Technology Entrepreneurship

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The above can offer to students of the BSc program a strong understanding of the relevant aspects of entrepreneurship, while maintaining a focus on financial technology throughout their studies. The relationship between the BSc Financial Technologies and the BCom in Entrepreneurship and Innovation can further be deepened in the future through the introduction of a major/minor configuration, whereby students can major in FinTech and minor in Entrepreneurship.

Recommendation 3- the proposed BSc aspires to build strong ties with the The BlockchainHub at York University as follows:

All senior FinTech students will be fully qualified to take the blockchain certification courses offered by The BlockchainHub if they desire to become trained in specific networks, tools and languages including Ethereum/Solidity, Hyperledger Fabric and EOS. The BSc core courses will offer excellent theoretical foundations for students to master the tools taught in these courses.

The BlockchainHub also offers an excellent context in which blockchain-specific capstone projects with an entrepreneurial vision can be executed. Specifically, the incubation environment of The BlockchainHub's C-Lab is a natural place in

which students' ideas could be developed into marketable products and services.

Other curriculum updates and clarifications

As discussed above, the content of FINT2010 – Introduction to Financial Technologies has been updated to reflect the need for greater introductory Finance content. We believe that it is important that students are offered a survey of the areas comprising the broad field of financial technology no later than the 2nd year of their studies, which will guide them in choosing future electives. Students will deepen their understanding of the role of banks and financial intermediaries in the economy in FINT3620 – Financial Intermediation and Banking and how capital markets work in FINT4620 – Capital Markets and Trading.

The proposal continues to maintain separate introductory courses for micro- and macroeconomics to ensure that students have a foundational understanding of how markets work, prior to focussing on financial institutions and services. Also, since both of these courses are prerequisites for third-year economics courses, these courses will permit greater choice among electives and will open more academic pathways.

The program has also been updated to allow deeper specialization into Security and Cloud Computing through participation to the BSc in Computer Science in Software Development (CSSD), proposed for Markham in parallel to this program. Specifically, a number of CSSD courses have been added as electives (CSSD2221 – Intro to Security Threats being required), constituting a foundation on which strategic choice of non-major credits from CSSD can offer stronger specialization into those two areas.

The program will cover aspects of digital identity in FINT4730 - Financial Cryptography and Blockchain. Further, it will cover the foundations of smart contract languages such as Solidity (Ethereum) or Chaincode (HL Fabric) in FINT4730. High-assurance software engineering in these languages is covered in FINT4230 – Software Quality Assurance and interested students can pursue a smart-contract-based project in FINT4000 – Capstone Project. Additional tool-specific training can be acquired through The BlockchainHub's many certification courses, as described above. The formation of an industry advisory board is indeed a part of our agenda to further develop, enrich and ensure the relevance of the BSc in Financial Technologies program.

We again want to thank the reviewer for their thorough comments and recommendations, which we believe the program has now addressed and adopted as best possible. The program has added a substantial number of core and elective finance courses, created an entrepreneurship component, and have taken additional measures to ensure that graduates are financially literate and job-ready for internships and full-time positions in the financial services

industry. Finally, the program proposal now outlines opportunities for future growth (e.g. sister BCom and BA programs), which we hope will exploit whatever opportunities for FinTech education this program leaves unexplored.

In terms of the resources and infrastructure needed to deliver this program, I am pleased to note that LA&PS will commit to offering several supports. We are willing to resource the following hiring plan for full-time, tenure or tenure-track YUFA appointments to Financial Technologies: two hires in 2022, two hires in 2023, one each in years 2024 through 2028, as well as two to three potential cross-appointments of existing faculty members to the program. Rank and area of expertise prioritized for each posting will be confirmed collaboratively between the Dean's Office and the program's home academic unit during each year's recruitment cycle. Second, space planning at Markham Campus for LA&PS programs was undertaken to ensure that there would be adequate office space for faculty members to conduct research and meet with students, so the need for office space set out in the proposal can be met. Finally, I note that the Markham Campus is outfitted with computer labs and collaborative spaces to meet the needs of the program's course offerings. These spaces are managed centrally and are not part of the Faculty's designated space on the campus; however, I am confident that the campus's space and infrastructure plan supports the successful delivery of this program. Administrative and service supports for students and faculty in the program are also organized through a central collaborative effort and are adequate to ensure successful delivery of the Honours Bachelor of Science in Financial Technologies, which I am excited to see launch. In sum, this is a high-quality proposal of an important strategic academic initiative that I support in full.

Sincerely,



J.J. MacMurtrei
Dean
Faculty of Liberal Arts & Professional Studies

cc: Alice Pitt, Senior Advisor, Markham Academic Strategic Planning

Memorandum

FACULTY OF LIBERAL ARTS & To:
PROFESSIONAL STUDIES

APPRC Academic Planning and Resource Committee

Office of the Dean

From: Sean Kheraj, Associate Dean, Programs, LA&PS,

Sean Kheraj

Date: April 27, 2022

Associate Dean, Programs

Subject: Summary of the feedback on proposal to establish the BSc degree program in Financial Technologies

S909 South Ross
4700 KEELE ST.
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This memo is to accompany the Dean's letter of support provided in the proposal package to establish the BSc degree program in Financial Technologies. In consultation with the Director of the School of Information Technology, and the proponent of the proposal, Sotirios Liaskos, we look forward to connecting with the Lassonde School of Engineering as the program evolves in exploring a joint faculty option, given the program's disciplinary and curricular focus and the shared curriculum plans. Further, we support future plans for Lassonde to make appropriate faculty complement requests for new faculty to teach courses in support of the FINT program via the Markham hiring process. We envisioned this to be part of future planning for the program's growth after launch.

To address the lab space available at the Markham Campus, we can confirm that the Provost's letter has now been added to the proposal for the committee to review.

Sincerely,

Sean Kheraj
Vice Dean and Associate Dean, Programs

Faculty of Liberal Arts and Professional Studies
Associate Professor



Memorandum

**OFFICE OF THE
PROVOST & VICE-
PRESIDENT ACADEMIC**

9TH FLOOR KANEFF TOWER
4700 KEELE ST.
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T 416 736 5280

To: Martin Bunch, Chair, ASCP
From: Lisa Philipps, Provost & Vice-President Academic
Date: May 5, 2022
Subject: BSc Honours in Financial Technologies program

I have reviewed the materials for the proposed Bachelor of Science Honours program in Financial Technologies. The Dean of Liberal Arts & Professional Studies has provided an unequivocal letter of support for this new program and has responded robustly to the assessment of the external reviewers. This memo is my signal of strong support for this innovative and important program which contributes to the strength of existing programs in the Faculty of Liberal Arts & Professional Studies and York University. This new program is strongly aligned with the University's Academic Plan in its view toward interdisciplinarity, global outreach and professional learning.

The proposed Bachelor of Science Honours degree in Financial Technologies adds to York's existing experience and expertise in the fields of Administrative Studies and Information Technology a targeted and highly technical new focus on Financial Technologies. This is a growing and in-demand field globally and in the Toronto and York regions, where there is a high concentration of technology-intensive financial services industries. This program is unlike any other undergraduate program in related fields in Ontario and builds upon our University's established successes in related areas of study.

The BSc in Financial Technologies combines comprehensive financial knowledge with relevant information technology that is specific to the finance sector, offering emphases on artificial intelligence, data analytics, cybersecurity, high-assurance enterprise systems design and blockchain. Students will undertake an internship component as part of their studies and participate in a variety of experiential education opportunities throughout their course of study in addition to learning in the program's blended delivery model. Teaching and learning in the program will be strongly technology-enhanced and include hands-on learning and flipped classroom techniques.

With demonstrated demand for career-ready graduates in the sector and the region and a small number of existing programs that would sufficiently train students for the field at the undergraduate level, we anticipate a high degree of student interest in the FinTech BSc. This interdisciplinary program is designed to be amenable to part-time, first-degree students as well as to professionals in the region who are interested in entering the field. Drawing on faculty and expertise in the Faculty of Liberal Arts & Professional Studies' Schools of Administrative Studies and Information Technology, the Department of Economics and the Faculty of Science, York already has capacity to support this new program, and additional colleagues will be hired to teach in the BSc.



York is committed to ensuring provision of the bandwidth and computer server infrastructure needed for the successful delivery of the curriculum, and students will have access to the purpose-built computer labs that are integral to the teaching and learning of this program. Students will be supported by a suite of academic and administrative services that are to be shared across programs at the Markham Campus and will be able to make use of the full range of existing facilities at York's Keele and Glendon campuses. York University is committed to growing resources as the Markham Campus grows, ensuring that faculty and staff hires, lab spaces, access to experiential education and other necessary supports keep pace with student and campus demand.

The clear learning outcomes in this program have been carefully mapped into the progression of courses, instilling the strength and interconnectedness of knowledge and skills throughout the program. The BSc in Financial Technologies mobilizes the strengths of our new campus location and local relationships to produce graduates who are prepared for cutting-edge careers in the demanding and growing financial technologies sector. Recent revisions to the program proposal strengthen the accounting, finance and economic aspects of the program, take up more explicitly entrepreneurship and innovation through coursework and field projects, and build strong ties with York's BlockchainHub. A substantial number of additional core and elective courses has been added and additional care has been taken to ensure financial literacy and job readiness for this high-demand sector.

I have reviewed the enrolment projections indicating intake of 70-100 students per year and am persuaded that the resource demands to launch this program are both appropriate and accounted for and can be served by our current and future faculty and staffing plans for the Markham Campus. This program will be unique in Ontario and will draw upon practice-based and scholarly expertise that York University is more than capable of delivering.

On October 8, 2019, York University's Board of Governors approved the business plan for the University's new Markham Campus, situated in the heart of York Region, one of the fastest growing regions in Ontario. Following a rigorous planning process and the commitment of financial and in-kind resources from the City of Markham, York Regional Council and York University, construction began on the new campus in summer 2020.

The Markham campus is a \$275.5m project that is funded with support from the Government of Ontario, York Regional Council and the City of Markham. The building, designed by internationally celebrated architecture firm Diamond Schmitt, will accommodate up to 4,200 students in 400,000 square feet of light-filled space, with the potential to expand student capacity over time for as many as 10,000 students. The University's Board has approved a ten-year budget based on current enrolment projections, and the Ontario government has agreed to fund domestic student spaces as well as operations of the campus based on student enrolment.

Initial programs developed for York's Markham Campus focus on digital technologies, entrepreneurship, arts and emerging technologies, and communications. Strong research and academic support for students is offered by York University Libraries, and all facilities have been designed in collaboration with participating Faculties, programs and service units.

Staffing for the campus is ramping up, with key positions in place, and additional faculty and staff hires following. The Deputy Provost for Markham Campus report to both the Provost and the President of the University, and collaborates actively with Deans of Faculties present at the campus. Key senior staff roles – in Student Services and Advancement, for example – will oversee other aspects of campus management and operations. The Executive Director and Deputy Provost together are responsible for the administrative and

academic operations of the campus and are engaged in the hiring of staff and development of planning and operational committees with the Faculties offering programs onsite. In all cases, thorough searches are being undertaken to locate highly-qualified and diverse candidates who will bring excellence and expertise to this initiative.

The location of this campus in Markham is bringing York University to the downtown core of Markham, reaching out to students in this fast-growing community where they are. Markham Campus is a purpose-built facility that will offer all the support future students will need to achieve success in their programs of study. In addition, Markham students will be able to access all York University offerings and facilities at both its Keele and Glendon campuses, including undergraduate courses and offerings that can satisfy degree requirements outside of the major area of study.

I look forward to submitting the final proposals for approval to Senate, Quality Council and the Ministry of Colleges and Universities in due course.



December 2, 2021

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Re: Support for BSc Financial Technologies program at Markham

To Whom It May Concern:

On behalf of the Department of Economics, I am pleased to write this letter in support of the proposal for a new *Bachelor of Science (BSc) in Financial Technologies* to be offered at the new Markham Campus at York University.

We have reviewed the new program proposal and agree that there is a role for economics to play in the curriculum along with the mathematics, computing and finance components. In particular, the Department of Economics is happy to support the inclusion of our Principles of Microeconomics and Macroeconomics courses, ECON 1000 and ECON 1010, as requirements in the program. Students that meet the proposed admission requirements for the BSc in Financial Technologies (especially MHF4U Ontario high school math) will be well prepared to succeed in ECON 1000 and ECON 1010 courses. Furthermore, these courses will provide students with training in topics such as market dynamics, monetary policy, and marginal decision making which underpin the “financial” side of the program.

We appreciate the work that the program proponents have put into developing this new and innovative program. In summary, we are delighted to support the newly proposed Bachelor of Science in Financial Technology at the Markham Campus at York University.

Sincerely,

A handwritten signature in black ink, appearing to read "Neil J. Buckley".

Neil J. Buckley, Ph.D.
Undergraduate Program Director and Associate Professor
Department of Economics
Faculty of Liberal Arts and Professional Studies
York University



Saturday, October 23, 2021

Re: Letter of support / BSc Financial Technologies

TO WHOM IT MAY CONCERN:

FACULTY OF
LIBERAL ARTS AND
PROFESSIONAL
STUDIES

School of
Administrative
Studies

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I write this letter on behalf of the School of Administrative Studies in support of the proposal for a new *Bachelor of Science in Financial Technologies (FinTech)* to be offered at the new Markham Campus at York University.

The School of Administrative Studies has been consulted since the early stages of the development of this new program and there is no significant overlapping of curricula between the proposed program and the programs offered at the School of Administrative Studies. The School fully supports the proposed program with the following courses:

- ADMS2500 – Financial Accounting
- ADMS2511 – Management Information Systems
- ENTP/ADMS4945 – Technology Entrepreneurship

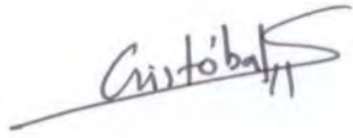
The new program opens exciting possibilities for further involvement of SAS with additional courses in several areas such as Finance, Auditing and Assurance, Accounting, and Entrepreneurship. We are happy to continue the conversation with the FinTech program leadership on how SAS can further contribute to the new program.

We would like to thank professor Liaskos for his efforts in developing this interesting and innovative proposal in this emerging and fast-growing field of Financial Technologies.

We fully support the development of the BSc of Financial Technologies at the Markham Campus at York University.

Sincerely,



A handwritten signature in black ink that reads "Cristóbal" followed by a stylized flourish.

Cristóbal Sánchez-Rodríguez, PhD
Associate Professor
sanchezc@yorku.ca

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FACULTY OF SCIENCE

**Department of
Mathematics and
Statistics**

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8 December 2021

The Department of Mathematics and Statistics is pleased to support the New Program Proposal of a Bachelor's degree in Financial Technologies (FinTech) at the Markham Centre Campus.

We plan to offer our existing courses Math 1013, Math 1014, Math 1131, Math 2030, Math 2280, and Math 2281 at the Markham Centre Campus to students in the FinTech program in the projected numbers.

In addition, we will work with ITEC on a course proposal for a new course Math 3285 on Introductory Quantitative Finance, which will be required for FinTech students.

We plan to offer Math 1013, Math 1014, Math 1131 to these students starting in 2023; Math 2030, Math 2280, and Math 2281 starting in 2024; and Math 3285 starting in 2025.

The Complement Plan for the Department of Mathematics and Statistics at the Markham Centre Campus explicitly includes these course offerings to students in the numbers projected in the FinTech New Program Proposal.

The Department of Mathematics and Statistics is pleased to contribute to this program and we expect it to be successful.

Best regards,

Stephen Watson

Professor Stephen Watson (he/him)
Chair
Department of Mathematics and Statistics
York University



Memorandum

To: John-Justin McMurtry, Dean, Faculty of Liberal Arts and Professional Studies

cc: Sean Kheraj, Associate Dean, Programs
Kathryn M. Doyle, Associate Director, Faculty Curriculum
Sotirios Liaskos, Director of the School of Information Technology

From: Detlev Zwick, Interim Dean, Schulich School of Business

Date: October 6, 2021

Subject: Proposal for MCC-based (Honours) Bachelor of Science in Financial Technologies

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I am pleased to provide this letter of consultation on behalf of the Schulich School of Business for the Faculty of Liberal Arts and Professional Studies' proposed new degree program – the (Honours) Bachelor of Science in Financial Technologies – which is being planned for a launch at the Markham Centre Campus in fall 2023. The School fully supports the development of this new program.

Schulich applauds the Faculty's vision of creating this Bachelor of Science in Financial Technologies for offering at our Markham Centre Campus. We believe that the proposed degree program with its specific industry orientation and strong experiential component is in line with the Markham Centre Campus vision and will be an important contribution to York's efforts in this regard.

Colleagues reviewed the proposed curriculum closely and found it to be complimentary to the curriculum of Schulich's BBA Specialization in Finance. We do not see this program as being in competition with Schulich's undergraduate activity and we do not believe it would create any confusion in the market.

There may be opportunities for collaboration at the course level between our two Faculties arising from the launching of this program. We would welcome discussion as to whether Schulich undergraduate students might consider fulfilling their degree requirement of non-Schulich courses through enrolment in courses in this program as well as the idea of opening some seats in our undergraduate courses for your students. Math and computer programming are important skills for future finance professionals, and the proposed curriculum would result in graduates from this new degree program being quite marketable. Of course, graduate credentials will increase marketability in the field and so students in this program may wish to consider continuing their studies in one of our Master programs.

On behalf of the Schulich School of Business I wish the Faculty of Liberal Arts and Professional Studies every success in implementing this new program.

January 14, 2022

To the Committee on Curriculum, Curricular Policy and Standards (CCPS),

**Re: Letter of Support - Bachelor of Science in Financial Technologies
Program, Markham Campus**

FACULTY OF
LIBERAL ARTS &
PROFESSIONAL STUDIES

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The LA&PS Experiential Education Office offers this letter in support of the Bachelor of Science in Financial Technologies Program and its proposed internship component and other experiential education opportunities that support the vision and goals of the new Markham Campus, the University Academic Plan, and the Faculty.

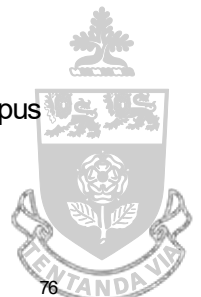
The proposed internship component is aligned with current National best practices in work-integrated learning and will make an important contribution to providing Markham Campus students with high-impact learning experiences within the vibrant York Region. The proposed program structure and eligibility requirements align with those of the existing optional LA&PS Internship Program, including enrollment in a 120 credit Honours degree program, good academic standing, and completion of 54 credits to participate. Internships are always paid, full-time work experiences with an industry partner and require students to take a break from full-time academic studies for the duration of the work term (either 4, 8, 12 or 16 months of employment). As per National co-op and internship guidelines, students must return to one term of full-time studies after their final work term, and therefore may remain eligible to job seek in the program until they have fewer than 9 credits remaining in the degree to graduate. After accepting an internship job offer at a company, students are enrolled in a 0-credit work term course that supports their learning and reflection during the work experience and maintains students' full-time status at the University. It is common best practice for industry supervisors to provide feedback and evaluation of students' workplace performance and relevant skills, which in addition to students' own critical reflection on the experience, are used to assess the credit/no credit grade for the work term course.

The LA&PS Experiential Education Office, in partnership with the AVP Teaching & Learning and leaders currently planning for the launch of the Markham Campus, is looking forward to lending its expertise to support the development, execution, and ongoing administration of the Internship Program and other curricular experiential education opportunities as needed for the BSc Financial Technology Program and its students to thrive.

Sincerely,




Melanie Belore
Associate Director, Experiential Education
AVP T&L Special Advisor on Experiential Education Strategy, Markham Campus



MEMO

TO: Sean Kheraj, Vice Dean and Associate Dean, Programs
Faculty of Liberal Arts and Professional Studies

FROM: Dan Palermo, Vice Dean, Lassonde School of Engineering 

CC: Richard Hornsey, Chair, Department of Electrical Engineering & Computer Science
Alice Pitt, Senior Advisor, Markham Academic Strategic Planning

SUBJECT: Statement of Support for LA&PS Honours Bachelor of Science – Financial Technologies (FINTECH)

DATE: February 9, 2022

I am pleased to express our support for the new Honours Bachelor of Science – Financial Technologies (FINTECH) program to be launched at the Markham Campus in fall of 2023. Similar to the two new Lassonde School of Engineering (LSE) programs (Computer Science for Software Development and Digital Technologies) recently approved by York Senate, the delivery of FINTECH is in line with York University's strategic priorities with a commitment to the Markham community in providing increased access to talent to address the skills shortage in the ICT sector.

The proponents of the proposed FINTECH program from LA&PS have consulted with colleagues in our Department of Electrical Engineering and Computer Science (EECS) on the structure of the program and the proposed courses. Through this consultation, the Department of Electrical Engineering and Computer Science (EECS) has agreed to deliver courses for the FINTECH program at Markham starting in the fall of 2023 that are aligned with the area of computer science and with their expertise. It is noted that these courses are incorporated into the program's curriculum to satisfy the learning outcomes that are core to the program. LSE and EECS are committed to ensuring that these courses are made available as required at the Markham Campus. This includes the following list of courses, that are currently identified in the proposal:

CSSD2221	Intro to Security Threats
CSSD2211	Introduction to Cloud Computing
CSSD3xxx	Web and Mobile Programming
CSSD3221	Network Security

Colleagues from EECS will collaborate with the proponents of the FINTECH program to further develop the above noted courses to meet the course learning objectives and program level outcomes of the FINTECH program. LSE and EECS are also prepared to deliver other courses listed in the proposed FINTECH curriculum in addition to those listed above. This will include courses that encompasses content that is within the expertise of EECS. The proponents of FINTECH will continue to consult with EECS on the development of these other courses, and this consultation will guide which colleagues are suited to deliver the courses and where additional faculty complement is required.

The above noted CSSD courses will require one additional faculty member within EECS to deliver the courses for the FINTECH program. Thereafter, commensurate with the courses in addition to the CSSD courses, additional complement may be required for LSE. The current complement plan for EECS at Markham only considers the delivery of the two Lassonde programs.

Lassonde also supports ongoing collaboration as FINTECH admits its first cohort and reaches key milestones in its development as a program in this emerging field of study. EECS has agreed to participate in the ongoing operationalization of the program to ensure its success. Given that EECS will be responsible for two additional four-year programs at the new campus, scheduling courses collaboratively will be a priority as will be ongoing evaluation of the suitability of the curriculum for student learning and achievement of the learning outcomes. Adjustments may be required based on how well FINTECH students are prepared to succeed in the CSSD courses, and ongoing shared responsibility for the implementation and development of the program is required.

Lassonde looks forward to these discussions and to the articulation of governance processes and procedures that will support collaboration, particularly in light of the program's expressed interest in establishing a stand-alone academic unit at the Markham Campus.



Tuesday, April 12, 2022

Re: Letter of support / BSc Financial Technologies

TO WHOM IT MAY CONCERN:

**School of
Administrative
Studies**

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I write this letter on behalf of the School of Administrative Studies in support of the proposal for a new *Bachelor of Science in Financial Technologies (FinTech)* to be offered at the new Markham Campus at York University.

The School of Administrative Studies has been consulted since the early stages of the development of this new program and there is no significant overlapping of curricula between the proposed program and the programs offered at the School of Administrative Studies. The School supports the proposed program with the following courses:

- ADMS2500 – Introduction to Financial Accounting
- ADMS3530 – Finance
- ENTP/ADMS4945 – Technology Entrepreneurship

The following are some suggestions that might help improve the proposed program:

- Note that ADMS 3530 is an elective. Since one of the two main focuses of the program is finance, perhaps ADMS 3530 should be a required course and not a choice.

- On FINT 3630, it wasn't in the original proposal, and we weren't consulted about any overlap with ADMS 4501. However, from the brief course description and comparison with ADMS 4501 outline, it seems more mathematical and quantitative than ADMS 4501. If that is the case, then we don't see any issue with it.

- FINT 4610, it is called Financial Decision Making but this term could imply things different than the description (e.g. from a personal finance, corporate finance or accounting perspective). It might be best called Quantitative Analysis for Financial Decision Making, Quantitative Modelling in Finance, Data Analysis for financial decision making, Mathematics of Financial Decision Making, or Optimization in Financial Decision Making etc.

- The program seems to emphasize that CFA is incorporating technology into their program. It's unclear whether it is implied that the degree will prepare students to sit the CFA examination, which we don't think it is the case.

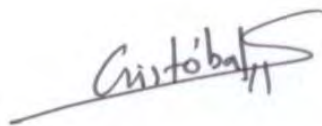


- FINT 2010 Introduction to Financial Technologies: this course is similar to an intro course in banking, financial services, and financial institutions. Maybe the course title could be changed to reflect this similarity. For example, Technologies in Financial Services, Introduction to Financial Services, or Introduction to Banking and Financial Institutions etc.
- FINT 3620 Financial Intermediation and Banking: the short course description suggests that this course is rich in risk management in banking. So, maybe the course title could be changed to Financial Intermediation and Risk Management in Banking. Indeed, FINT 2010 and 3620 can serve as a sequence of Financial Services and Banking I and II.
- FINT 3630 Investment Management: FINT 3630 elective is built on FINT 4610 required. It is unusual for a 3000-level course to be built on a 4000-level course, perhaps FINT3630 should move up to a 4000-level course too.

The new program opens exciting possibilities for further involvement of SAS with additional courses in several areas such as Finance, Auditing and Assurance, Accounting, and Entrepreneurship. We continue the conversation with the FinTech program leadership on how SAS can further contribute to the new program.

We support the development of the BSc of Financial Technologies at the Markham Campus at York University.

Sincerely,



Cristóbal Sánchez-Rodríguez,
PhD
Undergraduate Program Director
Associate Professor
sanchezc@yorku.ca

School of Administrative Studies, Faculty of Liberal Arts and Professional Studies,
York University, Tel. 416 736 2100 Ext 22893
Atkinson Building, Room 282, 4700 Keele Street, Toronto, Ontario M3J 1P3, Canada



Tuesday, April 12, 2022

Re: Letter of support / BSc Financial Technologies

TO WHOM IT MAY CONCERN:

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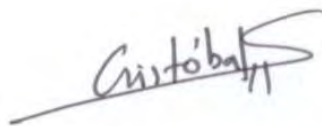


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The new program opens exciting possibilities for further involvement of SAS with additional courses in several areas such as Finance, Auditing and Assurance, Accounting, and Entrepreneurship. We continue the conversation with the FinTech program leadership on how SAS can further contribute to the new program.

We support the development of the BSc of Financial Technologies at the Markham Campus at York University.

Sincerely,



Cristóbal Sánchez-Rodríguez,
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Undergraduate Program Director
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Committee on Curriculum, Curricular Policy and Standards

March 2022

ITEM FOR ACTION (1):

1. The Committee on Curriculum, Curricular Policy and Standards recommends that Council approve the establishment of a Bachelor of Science degree framework in the Faculty of Liberal Arts and Professional Studies and add academic standards, policies, rules, and regulations specific to the BSc framework to the Faculty-delineated sections of the Academic Calendar.

Academic Rationale

The motion to establish a Bachelor of Science degree framework for LA&PS is proposed to complement the anticipated new honours major in Financial Technologies offered by the LA&PS School of Information Technology at the Markham Campus. The BSc option would be in addition to the five other undergraduate degree types offered by LA&PS (Bachelor of Arts, Bachelor of Commerce, Bachelor of Human Resource Management, Bachelor of Social Work, and Bachelor of Disaster and Emergency Management) and reflects the interdisciplinary range of our Faculty. The motion has been reviewed and approved by the Academic Policy and Planning Committee of LA&PS.

Although the Faculty of Science has for years offered Bachelor of Arts degree options in fields such as Kinesiology, the Faculty of Liberal Arts & Professional Studies does not currently offer a Bachelor of Science in any of its programs. This motion is deemed necessary to support the approval of a Financial Technologies program that would fulfill the academic standards, regulations, and degree structure requirements of existing LA&PS policies, on the one hand, but also is aligned with the University's approved curricular structure for Bachelor of Science degrees. These requirements overall must be articulated and included among the policies and standards set for the existing degree types (including: Bachelor of Arts, Bachelor of Commerce, Bachelor of Human Resource Management, Bachelor of Social Work, Bachelor of Disaster and Emergency Management) in the Faculty).

The School of Information Technology's proposal to establish Financial Technologies provides considerable evidence that a Bachelor of Science is the most appropriate degree framework to organize the program. The computer science and mathematical components required within the Financial Technologies curriculum to best prepare students for advanced study or the pursuit of careers in this field align with the degree structure articulated in the [BSc Matrix](#), a Senate-approved policy on the components that comprise all Bachelors of Science offered at York University. Moreover, the Financial

Technologies proposal also shows that the Bachelor of Science is the most widely expected degree type in this field among graduate programs, prospective students, faculty, and employers. Offering the Financial Technologies major as an Honours Bachelor of Science will support competitive recruitment and retention efforts by the Faculty and will help to ensure that the program is sustainable after its launch.

Bachelor of Science Degree Framework in LA&PS

Faculty-wide Degree Requirements

Honours Bachelor of Science (Honours BSc) Degree (120 Credits)

General Education

The Faculty of Liberal Arts and Professional Studies general education curriculum provides students with the foundation of interdisciplinary knowledge, breadth, methods and the approaches necessary for successful liberal and professional education. General education courses approved for credit expose students to ways of knowing and fundamental ideas spanning the humanities, science, and social science. These courses also provide explicit instruction in critical analytical skills and thought and its communication in writing and speech.

Students completing a Bachelor of Science in LA&PS take a minimum of 30 general education credits composed of foundational studies in mathematics, computation, laboratory science and human enquiry outside of science as detailed below.

30 credits General Education, as follows:

- a. Non-science requirement—at least 15 credits comprised of:
 - i. 9.00 credits in either the humanities or social science categories from the approved list of Liberal Arts & Professional Studies general education courses
 - ii. 6.00 credits from the opposite category (social science or humanities) from the approved list of Liberal Arts & Professional studies general education courses
- b. 1000-level Mathematics (excluding modified courses)—at least 6 credits
- c. 1000-level computation courses—at least 3 credits
- d. 1000-level foundational science—at least 6 credits from courses with laboratories in either BIOL, CHEM, PHYS (in place of the 6.00 NATS general education credits required for all LA&PS students not enrolled in a Bachelor of Science).

The Major Requirement

Honours Major: at least 42 credits, including at least 18 credits at the upper level (3000- or 4000 level), at least 12 of which must be at the 4000-level. Details of a program's major requirements can be found under the Program-Specific Degree Requirements tab in the Academic Calendar.

Upper-level Requirement

At least 42 credits at 3000 or 4000 level (all courses taken as part of the degree, including those as part of the student's major or minor, count towards this total).

Science Credits Outside the Major

BSc degrees at York are required to contain at least 24 credits in science disciplines outside the major (from BIOL, BCHM, BPHS, CHEM, CSE, EATS, GEOG, KINE, MATH,

PHYS, PSYC, STS) of which at least 3 credits must be at the 2000 level or higher. Science credits in the General Education requirements that are not in the major, as well as science credits required by the major that are not in the major disciplines, count toward this requirement.

Academic Standards

The progression, standing, and graduation requirements for students completing a Bachelor of Science in LA&PS are consistent with the University's Grading Scheme Policy, as follows:

- Students who have earned between 0-53 credits remain in their honours program provided they meet the University and program minimums;
- At 53 earned credits, students must have at least a 2.00 CGPA to continue in the honours program; if the CGPA is between 1.70 and 1.99, the student may continue on a warning for a review period of 30 credits; and, if the CGPA falls below 1.70 by 53 credits, the student is exited from the honours program and switched to the 90-credit program, guided by the Faculty; and,
- At 83 credits, the student must have at least a 2.00 CGPA to continue; if the CGPA is less than 2.00, the student is exited from the honours program and switched to a 90-credit program, guided by the Faculty.

Courses taken beyond the normal maximum: students in an Honours program who successfully complete (pass) more than 120 credits and whose cumulative grade point average is at least 2.00 will have all credits counted towards their Honours and their cumulative grade point average.

Graduating with an Honours BSc degree: to graduate in an Honours program, students must successfully complete (pass) at least 120 credits which meet Faculty of Liberal Arts and Professional Studies degree and program requirements. The cumulative grade point average must be at least 2.00.

Failure to maintain minimum Honours standing (BSc): Students who do not meet the conditions outlined above may continue their studies only in a 90-credit degree program, guided by the Faculty.

Residency Requirement

A minimum of 30 course credits and at least half (50 per-cent) of the course credits required in each undergraduate degree program major/minor must be taken at York University.

Graduation requirement

Honours Bachelor: students must successfully complete (pass) at least 120 credits which meet the Faculty's degree and program requirements with a cumulative grade point average of at least 2.00 and a major grade point average of at least 2.3.

Additional Policies and Requirements

All other Faculty- and University-wide policies, regulations, and standards apply to the Bachelor of Science in LA&PS as articulated

Side-by-Side Comparison of Faculty-wide Degree Requirements for Existing Degree Types and the Proposed Honours Bachelor of Science in LA&PS

Note: GPAs required for graduation in the existing degree types are expressed on the 9.0 scale (current) with the conversion to the new 4.0 scheme noted in square brackets beside; the GPA required for graduation in the Honours Bachelor of Science is consistent with the language of the Council motion and is expressed using the new 4.0 scale which is scheduled to take effect in 2023, before the anticipated Financial Technologies program is launched in LA&PS.

According to the Senate-approved policy, 2.0 on the 4.0 scale is the equivalent of 5.0 on the 9.0 scale.

	Honours Bachelor of Public Administration	(Honours) Bachelor of Arts	(Honours) Bachelor of Commerce	(Honours) Bachelor of Disaster and Emergency Management	(Honours) Bachelor of Human Resource Management	Honours Bachelor of Social Work	Honours Bachelor of Science
General Education	at least 21 credits including 6.00 credits in natural science; 9.00 credits in approved general education courses in the social science or humanities categories; 6.00 credits in approved general education courses in the opposite category to the 9.00 credit.					Direct Entry at least 21 credits including 6.00 credits in natural science; 9.00 credits in approved general education courses in the	30 credits General Education, as follows: a. Non-science requirement—at least 15 credits comprised of: i. 9.00 credits in either the humanities or social science categories from

	Honours Bachelor of Public Administration	(Honours) Bachelor of Arts	(Honours) Bachelor of Commerce	(Honours) Bachelor of Disaster and Emergency Management	(Honours) Bachelor of Human Resource Management	Honours Bachelor of Social Work	Honours Bachelor of Science
						<p>social science or humanities categories; 6.00 credits in approved general education courses in the opposite category to the 9.00 credit.</p> <p>Consecutive</p> <p>Students who enter this program are deemed to have fulfilled this requirement</p>	<p>the approved list of Liberal Arts & Professional Studies general education courses</p> <p>ii.6.00 credits from the opposite category (social science or humanities) from the approved list of Liberal Arts & Professional studies general education courses</p> <p>b. 1000-level Mathematics (excluding modified courses)—at least 6 credits</p> <p>c. 1000-level</p>

	Honours Bachelor of Public Administration	(Honours) Bachelor of Arts	(Honours) Bachelor of Commerce	(Honours) Bachelor of Disaster and Emergency Management	(Honours) Bachelor of Human Resource Management	Honours Bachelor of Social Work	Honours Bachelor of Science
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Residency	a minimum of 30 course credits and at least half (50 per cent) of the course credits required in each undergraduate degree program major/minor must be taken at York University						

	Honours Bachelor of Public Administration	(Honours) Bachelor of Arts	(Honours) Bachelor of Commerce	(Honours) Bachelor of Disaster and Emergency Management	(Honours) Bachelor of Human Resource Management	Honours Bachelor of Social Work	Honours Bachelor of Science
Graduation	<p>120-credit degree (Honours and Specialized)</p> <p>students must successfully complete (pass) at least 120 credits which meet the Faculty's degree and program requirements with a cumulative grade point average of at least 5.00 [2.0]</p>	<p>90-credit degree</p> <p>students must successfully complete (pass) at least 90 credits that meet the Faculty's degree and program requirements with a cumulative grade point average of at least 4.00 [1.70]</p> <p>120-credit degree</p>	<p>90-credit degree</p> <p>students must successfully complete (pass) at least 90 credits which meet the Faculty's degree and program requirements, with a cumulative and major grade point average of at least 5.00 [2.0]</p> <p>120-credit degree</p>	<p>90-credit degree</p> <p>Students must successfully complete (pass) at least 90 credits that meet the Faculty's degree and program requirements with a cumulative grade point average of at least 5.00 [2.0] and a major grade point average</p>	<p>90-credit degree</p> <p>students must successfully complete (pass) at least 90 credits which meet the Faculty's degree and program requirements, with a cumulative and major grade point average of at least 5.00 [2.0]</p> <p>120-credit degree</p>	<p>Direct Entry</p> <p>students must successfully complete (pass) at least 120 credits which meet the Faculty's degree and program requirements, with a cumulative grade point average of at least 5.00 and a minimum grade of 4.00 [1.7] in all major credits</p>	<p>students must successfully complete (pass) at least 120 credits which meet the Faculty's degree and program requirements with a cumulative grade point average of at least 2.00 and a major grade point average of at least 2.3</p>

	Honours Bachelor of Public Administration	(Honours) Bachelor of Arts	(Honours) Bachelor of Commerce	(Honours) Bachelor of Disaster and Emergency Management	(Honours) Bachelor of Human Resource Management	Honours Bachelor of Social Work	Honours Bachelor of Science
		students must successfully complete (pass) at least 120 credits which meet the Faculty's degree and program requirements with a cumulative grade point average of at least 5.00 [2.0]	students must successfully complete (pass) at least 120 credits which meet the Faculty's degree and program requirements with a cumulative grade point average of at least 5.00 [2.0] and a major grade point average of at least 5.50 [2.3]	of at least 5.00 [2.0] 120-credit degree students must successfully complete (pass) at least 120 credits which meet the Faculty's degree and program requirements with a cumulative grade point average of at least 5.00 [2.0] and a	students must successfully complete (pass) at least 120 credits which meet the Faculty's degree and program requirements with a cumulative grade point average of at least 5.00 [2.0] and a major grade point average of at least 5.50 [2.3]	Consecutive students must successfully complete (pass) at least 120 credits which meet the Faculty's degree and program requirements, with a cumulative grade point average of at least 5.00 [2.0] and a minimum grade of 4.00 [1.7] in all major credits	

	Honours Bachelor of Public Administration	(Honours) Bachelor of Arts	(Honours) Bachelor of Commerce	(Honours) Bachelor of Disaster and Emergency Management	(Honours) Bachelor of Human Resource Management	Honours Bachelor of Social Work	Honours Bachelor of Science
				major grade point average of at least 5.50 [2.3]			
Major Credits	<p>Honours</p> <p>As defined by the specific program, a minimum of 63 credits, including at least 12 credits at the 4000-level</p> <p>Specialized Honours</p> <p>As defined by the specific program; a minimum of 75 credits,</p>	<p>90-credit degree</p> <p>as defined by the specific program; a minimum of 30 credits, including at least 12 credits at the 3000 or 4000 level</p> <p>120-credit degree</p> <p>as defined by the specific program, a</p>	<p>90-credit degree</p> <p>as defined by the specific program; a minimum of 51 credits, including at least 18 credits at the 3000 or 4000 level</p> <p>120-credit degree</p> <p>as defined by the specific program,</p>	<p>90-credit degree</p> <p>as defined by the specific program; a minimum of 33 credits, including at least 12 credits at the 3000 level or above</p> <p>120-credit degree</p> <p>as defined by the specific program, a</p>	<p>90-credit degree</p> <p>as defined by the specific program; a minimum of 51 credits, including at least 18 credits at the 3000 or 4000 level</p> <p>120-credit degree</p> <p>as defined by the specific program; a</p>	<p>Direct Entry</p> <p>as defined by the specific program; a minimum of 60 credits, including at least 18 credits at the 4000 level</p> <p>Consecutive</p> <p>as defined by the specific program; a minimum of 54 credits, including at</p>	<p>at least 42 credits, including at least 18 credits at the upper level (3000- or 4000 level), at least 12 of which must be at the 4000-level. Details of a program's major requirements can be found under the Program-Specific Degree Requirements tab in the Academic Calendar</p>

	Honours Bachelor of Public Administration	(Honours) Bachelor of Arts	(Honours) Bachelor of Commerce	(Honours) Bachelor of Disaster and Emergency Management	(Honours) Bachelor of Human Resource Management	Honours Bachelor of Social Work	Honours Bachelor of Science
	including at least 12 credits at the 4000-level.	minimum of 42 credits, including at least 12 credits at the 4000 level	including at least 18 credits at the 4000 level	minimum of 48 credits, including at least 12 credits at the 4000 level	minimum of 81 credits, including at least 18 credits at the 4000 level	least 18 credits at the 4000 level	
Upper-level Credits	<p>120-credit degree (Honours and Specialized Honours)</p> <p>At least 36 credits at the 3000- or 4000-level, including at least 18 credits at the 4000 level</p>	<p>90-credit degree</p> <p>at least 18 credits at the 3000 or 4000 level including 12 credits in the major</p> <p>120-credit degree</p> <p>at least 36 credits at the</p>	<p>90-credit degree</p> <p>at least 18 credits at the 3000 or 4000 level</p> <p>120-credit degree</p> <p>at least 36 credits at the 3000 or 4000 level including at</p>	<p>90-credit degree</p> <p>at least 18 credits at the 3000 or 4000 level</p> <p>120-credit degree</p> <p>at least 36 credits at the 3000 or 4000 level, including at</p>	<p>90-credit degree</p> <p>at least 18 credits at the 3000 or 4000 level</p> <p>120-credit degree</p> <p>at least 36 credits at the 3000 or 4000 level including at</p>	<p>Direct Entry and Consecutive</p> <p>18 credits at the 4000-level, as stipulated by the Major credits</p>	At least 42 credits at 3000 or 4000 level (all courses taken as part of the degree, including those as part of the student's major or minor, count towards this total).

	Honours Bachelor of Public Administration	(Honours) Bachelor of Arts	(Honours) Bachelor of Commerce	(Honours) Bachelor of Disaster and Emergency Management	(Honours) Bachelor of Human Resource Management	Honours Bachelor of Social Work	Honours Bachelor of Science
		3000 or 4000 level, including at least 18 credits at the 4000 level	least 18 credits at the 4000 level	least 18 credits at the 4000 level	least 18 credits at the 4000 level		
Credits Outside the Major	at least 18 credits					Direct Entry At least 39 credits Consecutive students who graduate in this program are deemed to have fulfilled this requirement	BSc degrees at York are required to contain at least 24 credits in science disciplines outside the major (from BIOL, BCHM, BPHS, CHEM, CSE, EATS, GEOG, KINE, MATH, PHYS, PSYC, STS) of which at least 3

	Honours Bachelor of Public Administration	(Honours) Bachelor of Arts	(Honours) Bachelor of Commerce	(Honours) Bachelor of Disaster and Emergency Management	(Honours) Bachelor of Human Resource Management	Honours Bachelor of Social Work	Honours Bachelor of Science
							<p>credits must be at the 2000 level or higher. Science credits in the General Education requirements that are not in the major, as well as science credits required by the major that are not in the major disciplines, count toward this requirement.</p>

York University
New Program Proposal
of the
BSc/BA Honours
in
Data Science
Submitted: September 16, 2021

Note: Additional documentation available upon request.

1. Introduction

1.1 Provide a brief statement of the degree program(s) being proposed, including commentary on the appropriateness and consistency of the degree designation(s) and program name with current usage in the discipline or area of study.

The proposal is for a 120 credit BSc/BA honours degree in Data Science.

Data Science is a field that uses computing and mathematical and statistical reasoning to extract knowledge and insights from data. Data Science is interdisciplinary because it also draws from domain knowledge, where that domain might be business, economics, biology, astronomy, marketing, health, and many others.

The program is designed to prepare students to obtain meaningful employment in data science related positions, whether in private, public, or non-profit organizations.

In this program, each student will master the statistical methods, computation skills and data techniques that enable data scientists to extract knowledge from data, and each student will become familiar with the nature and needs of analyzing large and complex data, and with case studies specific to a particular domain such as business, health, biology, or psychology, through a capstone experience that engages students in research with data in an industrial setting.

Many institutions in Canada and USA offer programs in data science. Some of these programs emphasize computer science and some emphasize statistics. Some programs require specialization in a domain of application, and some do not. After substantial discussions with other programs, industry, and other departments, we have chosen a middle ground between computer science and statistics. This choice justifies calling the proposed program a BA/BSc in Data Science.

We have also decided to require specialization by each student in a domain of application, which we call a stream. Most programs do not do this, but the ones that do, including the BA in Data Science at University of California at Berkeley, have been the most successful. This choice justifies structuring the program both as a BA and as a BSc to accommodate students whose stream might be anything from business to biology. This choice also differentiates us from other undergraduate Data Science programs in Ontario.

In sum, this program meets the York requirements and the expectations of the academic community and prospective employers for a 120 credit BSc/BA honours degree in Data Science.

1.2 Provide a brief description of the method used of the development and preparation of the New Program Brief, including faculty and student input and involvement.

The program has been designed by a task force in the Department of Mathematics and Statistics.

The task force obtained substantial input from the Department of Electrical Engineering and Computer Science in the Lassonde School of Engineering, the School of Information Technology in the Faculty of Liberal Arts and Professional Studies, the Department of Philosophy, and the Writing Department, all of which are designing courses for this program.

We also obtained substantial input from professors in many subject matter disciplines within York University, including the Artificial Intelligence Taskforce, Operations Management and Information Systems at Schulich, the Faculty of Environmental & Urban Change, the Department of Economics, the Department of Physics and Astronomy, the Department of Biology, the Faculty of Health, the School of Health Policy and Management, the Department of Psychology, the Advanced Disaster Emergency & Rapid Response Simulation program, Osgoode Hall Law School, the School of Continuing Studies, the Department of Computational Arts in the School of the Arts, Media, Performance & Design, the Department of Science and Technology Studies, and the Applied Mathematics, Statistics, Pure Mathematics, Actuarial Science, Mathematical Biology, and Mathematics for Education programs in the Department of Mathematics and Statistics.

We obtained two market analyses from EAB Education Technology, Services and Research. One was a Market Pulsecheck, an evaluation of employer demand for the proposed program in the Ontario market, and student demand for similar programs. The other was a Program Feasibility Study that evaluated Data Science and Statistics programs in Ontario and California. We also obtained a program scan from the Office of Institutional Planning at York. These analyses and studies helped us make key decisions about such things as the required computing courses and whether to require a capstone course.

We met with the directors of various Data Science programs, including the University of California at Berkeley, the University of Oregon, University of Toronto (applied statistics), University of Victoria, Carleton University, and the University of British Columbia at Okanagan, and learned from them what has worked well, and what has not.

To develop the learning outcomes and curriculum content the task force conducted interviews with data science practitioners in a range of industries, including Shopify, Quartic, Deloitte, and Loblaw.

The task force used the market research conducted by EAB and the discussions we had with directors of other data science programs and with other units of York University to fully understand the emerging trends in data science and the expected knowledge requirements for graduates aspiring to enter careers in data science related fields. These discussions led us to include an ethics course and a writing course in the program. We then designed a draft curriculum to enable the program to achieve its learning outcomes. We presented the draft curriculum to data science practitioners and potential employers to validate the program design. These consultations led us to focus the programming requirements onto Python and R, rather than Java, and to lengthen the capstone course from 3 credits and one term to 6 credits and two terms.

We ensured that the program requirements meet the pan-University and Faculty of Science requirements for BA and BSc Honours degrees. The Educational Development Specialist of the Faculty of Science mapped the required courses onto the learning outcomes for the program.

In summary, this input from across the University, from data science programs across North America, from market research, and from prospective employers for graduates of the program has helped us design and validate a quality program that meets demand from students and employers, whose streams integrate well with York's existing and growing strengths, and whose capstone experience differentiates this program from competing programs in Canada.

1.3 Indicate the Faculty/unit in which the program will be housed.

The program will be housed in the Department of Mathematics and Statistics in the Faculty of Science.

1.4 Indicate the location/campus of the new program.

The program will be located on the Keele campus.

2. General Objectives of the Program

2.1 Provide a brief description of the general objectives of the program.

The program will provide students with the specialized education in data science with which they can leverage emerging data science technologies for the generation of insights and solutions to challenges organizations face in rapidly changing business and policy environments. Graduating students will learn both the theoretical and applied perspectives of data science technologies and be knowledgeable in their stream subject. They will be effective communicators, able to effectively participate with others in data science projects and conscious of the ethical and social responsibilities of data science. They will not only master the hands-on skills necessary for initial employment, but also become able, creative, curious, entrepreneurial thinkers who can thoughtfully contribute to a world of rapid technological change.

The Honours BA/BSc in Data Science offered by the Faculty of Science will provide students who have a secondary school diploma with:

Core Knowledge and Understanding of the key concepts of data science, including data management, data visualization, data processing, data analytics, data mining, applied artificial intelligence, programming languages, machine learning, and the connections between these components and a stream of their choice, such as Biology, Business, Health, or Computational Arts.

The Technical, Analytic, and Decision-Making Skills needed to acquire, clean, reduce, model, visualize, store, evaluate, and interpret data from real world, to identify, analyze, and find solutions for complexities in data science in a specific domain, and to find actionable solutions for real-world issues.

Professional Communication Skills needed to effectively communicate data science concepts, data, and arguments through written, visual, and oral media to peers, co-workers, and the public, and to effectively collaborate across disciplines.

Students will also graduate with the skills to identify ethical issues and implications in data science and the ability to demonstrate initiative, academic integrity, and personal responsibility in industrial and classroom settings.

Students who have successfully completed the program requirements and received an Honours BA/BSc in Data Science will have the necessary skills, knowledge, and experience to obtain employment in, and immediately contribute to the success of, employers in a wide range of industries.

The program will achieve these objectives over the course of four years of full-time study and the completion of 120 credits. The program is structured to facilitate the acquisition of data science and knowledge and skills in their stream over four years. A key component of the program is the integration of the acquired knowledge through a capstone experiential learning project in the 4th year.

2.2 Describe how the general objectives of the program align with University and Faculty missions and academic plans.

The development of the Data Science BA/BSc program is well aligned with the York University Academic Plan, the Faculty of Science Strategic Plan, and the Strategic Mandate Agreement.

Data Science majors command high salaries (SMA metric 1). The emphasis on data from domains like economics, business, geography, or psychology and the 4th year capstone project are inherently experiential (SMA metric 2). Graduates will have the skills for the labour market, and in any career, competency in understanding data will serve them well (SMA metrics 3,4). Data Science research faculty will fit well between York's statistics strength and its leadership in industrial mathematics and will bring new government and industrial research funding to York, with other researchers across the university (SMA metrics 5, 7, 8). This aligns with York's Strategic Mandate Agreement with the Province of Ontario.

Data Science graduates will be equipped with knowledge, transferable skills, and values to navigate a constantly changing world. This new program is designed to address the emerging need for expertise in data science in the labour market across nearly all industries. The program will be the leader at York in bringing essential digital fluencies and information literacies to our students. Data Science graduates from York will be known for their ethical judgment, critical thinking, and the ability to ask good questions, gather evidence, and communicate effectively across varied media. Each student will appreciate the need, even after graduation, to be lifelong learners. Each student will become ready for the labour market with a two-term experiential learning capstone project in their final year. This aligns well with UAP 1 (21st Century Learning) of the University Academic Plan.

As this program grows, new Data Science research faculty will engage in new research activity at York and increase the participation in Data Science research by undergraduates, graduate students, post-doctoral fellows, and faculty members in related areas of interest in units across the university. These new faculty will bring new government and industrial research funding to York, especially in collaboration with other researchers across the university. These new

researchers will fit strategically between York's existing strength in statistics and its national leadership in industrial mathematics. Much of this new data science research will be in partnership with external companies and organizations, and this activity will deepen our external partnerships and engagement in the sharing of knowledge and creativity. These partnerships will also increase involvement by students and faculty in innovation and entrepreneurship. This aligns well with UAP 2 (Knowledge for the Future) and UAP 5 (Working in Partnership) of the University Academic Plan.

The high-quality Data Science program will provide students with the knowledge, skills, and credentials they desire to successfully transition into rewarding and impactful careers. Data Science is highly demanded by both employers and students, and the expected popularity of this program will bring substantial new enrolment for both domestic and international students. Data Science will promote and position the Faculty of Science as a preferred collaborator and partner on the international stage - several universities in China have already expressed interest in sending their students to York to study Data Science. The streams of the Data Science program will help differentiate the Faculty of Science by providing a program that directly addresses societal needs and increased intra- and inter-faculty collaboration. This aligns well with the Faculty of Science Strategic Priority on Teaching & Learning.

The emphasis on Data Science research by new faculty as this program grows will help us recruit and retain world-class faculty and trainees in an emerging area of research excellence. Data Science is a field that relates to many other areas in the liberal arts, social sciences, media arts, environmental studies, health, engineering, and science, and in bringing together computing, statistics, mathematics and these domain areas, data science is inherently and intensely collaborative. The research programs of new faculty in data science will increase external research funding to the Faculty of Science from sources including government and industry, especially through strategic and team applications. Almost every industrial and government entity needs to analyze and understand large amounts of data, and so this emerging strength in data science will also expand the research connections and partnerships of the Faculty of Science with industry and government – locally, nationally, and internationally. This aligns with the Faculty of Science Strategic Priority on Research.

The full-year capstone course provides an experiential learning opportunity to data science students and enhances their access to career paths after graduation. The industrial participation in the capstone course increases the internship and industry mentorship opportunities for our students and will bring some data science students into the entrepreneurial ecosystem within York and externally to help prepare our students for the job market and open opportunities to entrepreneurial career paths. This aligns with the Faculty of Science Strategic Priority on Student Experience and Success.

2.3. Describe the appropriateness of the degree nomenclature.

This program will follow the traditional BA and BSc designations and follow both the pan-University requirements and Faculty of Science requirements for each of these degrees. We propose both since the wet lab experience required by the BSc in the Faculty of Science is inappropriate for data science students focused on marketing or computational arts, and such students should complete a BA in Data Science. Conversely, data science students

focused on data from genetics or astronomy should have a basic understanding of experimental biology or physics, and a BSc is appropriate.

3. Need and Demand

3.1 Identify similar programs offered at York and/or by other Ontario universities, with special attention paid to any innovative and distinguishing aspects of the proposed program.

The Office for Institutional Planning and Analysis at York performed a program scan of select academic programs related to Data Science at a local, regional, and international level. The taskforce also interviewed the directors of many of these Data Science programs. These directors were helpful and shared with us where their programs are today and what changes they plan to implement.

Most of the institutions studied offer what amounts to a double major in Mathematics and Computer Science with a specialization in Data Science. These programs are small and elite and are aimed at preparing students for graduate school. Examples include McMaster, University of Ottawa, University of Waterloo, and the University of Toronto's "limited enrolment data science specialist program." This is not the direction we choose. We already have a successful and elite statistics honors program aimed at preparing students for graduate school. Some institutions offer a data science "add-on" to a degree in computer science or a degree in mathematics. These programs provide inadequate training in statistics (or mathematics). Examples of this include Ontario Tech University and Seneca College.

Most data science programs do not require students to take courses in areas where data science is useful, with the notable exceptions of the successful data science program at University of California at Berkeley with more than 1000 majors after 4 years, the remarkably successful applied statistics program at the University of Toronto with more than 3500 majors, and the University of Oregon data science program with 120 students after 1 year. The founder of this applied statistics program told us that despite the name, this is a data science program, but not of the double-major type. Another example is Wilfrid Laurier University, although their stream choices are limited. We do choose this direction and require each data science student to choose a stream.

In summary, we have only found three data science programs in North America that provide students with a strong knowledge of statistics, computing, and a domain area, and which are aimed at labor market needs are the UC Berkeley data science program, the University of Toronto applied statistics program, and the University of Oregon data science program. We interviewed the directors of all three of these programs at length. The York proposal follows their program designs, sometimes learning from their experience and sometimes tailoring the program to York's strengths.

York does not currently offer any program like the proposed data science program.

The School of Information Technology (ITEC) in the Faculty of Liberal Arts and Professional Studies at York is proposing an undergraduate program in Financial Technologies (FinTech).

The Department of Mathematics and Statistics has discussed that program at length with ITEC and is contributing six courses to the FinTech program. Conversely ITEC is contributing three courses to the Data Science program. The focus of the FinTech program is on financial technologies, and on computing and information technology training aimed at preparing graduates for a career in technology-intensive roles within the financial sector.

The Data Science program, by contrast, provides a specialized education in data science, including both the theoretical and applied perspectives of data science technologies. The great difference between the two programs can be seen best by comparing the required courses of the two programs. FinTech requires a single first year statistics course. Data Science by contrast requires a solid knowledge of statistics, including Math 1130.03 (Introduction to Data Science), Math 1131.03 (Introduction to Statistics I), Math 2130.03 (Principles and Techniques of Data Science), Math 2131.03 (Introduction to Statistics II), Math 3330.03 (Regression Analysis), Math 3333.03 (Data Analytics: A Hands-on Approach), Math 4036.03 (Introduction to Statistical Machine Learning), and Math 4931.03 (Simulation and the Monte Carlo Method). Conversely, Data Science requires no courses related to finance, except for a single first year course for students in the business stream. FinTech by contrast requires an extensive knowledge of finance and financial technologies and requires FINT 2010.03 (Introduction to Financial Technologies), ADMS 2510.03 (Management Accounting), ADMS 2511.03 (Management Information Systems), ADMS 3530.03/MATH 2280.03 (Models of Financial Economics), FINT 3510.03 (Applied Financial Cryptography), FINT 3010.03 (Cases in Financial Technologies), FINT 3310.03 (Machine Learning for Finance), FINT 4610.03 (Operations Research in Finance), FINT 4720.03 (Blockchain Technologies), FINT 4720.03 (Cryptoeconomics), None of these courses are required in the Data Science program, even for those in the business stream.

The required courses of two programs do overlap in lower-level MATH courses taken also by students in the Lassonde Faculty of Engineering. The only other courses required in both programs is MATH 1131.03 (Introduction to Statistics I) and ITEC 3310 (Data Visualization), the latter a new course developed for both the Data Science program and for ITEC students. ITEC has also written a letter of support for the Data Science program, which is included in Appendix N.

The School of Continuing Studies (SCS) at York offers some professional programs related to data science. We discussed these with Tracey Taylor-O'Reilly, Assistant Vice-President. Indeed Dr. Taylor O'Reilly greatly helped us with the market research for the Data Science program. The professional programs offered by SCS that are closest to the Data Science program are the Certificate in Advanced Data Science and Predictive Analytics and the Certificate in Big Data Analytics. These certificate programs require three 36-hour courses each. None of these courses overlap substantially with any of the required courses of the Data Science program. Perhaps the closest courses to CSDA 1100, CSDA 1110, CSDA 1120, CSDA 2000 and CSDA 2010 might be AP/ITEC 3040.03, SC/MATH 1130.03, AP/ITEC 3220.03, LE/EECS 4415.03 and AP/ITEC 3040.03, respectively. SC/MATH 1130.03 is required by the Data Science program, while the others are available as electives in the Data Science program. The statistics courses are central to the proposed Data Science program, while the SCS certificates require no statistics training at all.

3.2 Provide brief description of the need and demand for the proposed program, focusing as appropriate on student interest, social need, potential employment opportunities for graduates, and/or needs expressed by professional associations, government agencies or policy bodies.

Data Science is an interdisciplinary field focused on extracting knowledge from data and applying insights from data to solve problems in the real world was first described in 1962. The concept of data science as a discipline emerged only in the last 20 years. Today data science is understood to bring together mathematics, statistics, computer science, and knowledge within the domains to which it is applied.

In the past 20 years, data science has emerged as a key competence for any business or government entity. This has been driven by the rise of the internet and other digital technologies, and increases in computing speeds and data storage capacity, and the collection of vast amounts of data related to business activities. There is too much data to analyze with primitive methods. Businesses need the specialized skills of data scientists to make sense of all this data and get actionable insights from it. Data Scientists can do this: they can provide quantifiable data driven evidence that empowers management to make better decisions; they can identify opportunities for new and relevant products and can identify target audiences and personalize their experiences; and they can mitigate risk.

The EAB Market PulseCheck market research concluded that employment for data science professionals in the “top four occupations are projected to increase at least two times faster than the average.” That report also stated that “York University can potentially emerge as a dominant competitor in an untapped market.” Bachelor’s in Data Science (NOC 2172, 2171) have “above average” outlook, 3000-4000 jobs annually, 92% growth (2010-2019), and average pay \$86,295 (<https://www.services.labour.gov.on.ca/labourmarket/search.xhtml>).

Student demand is evident from the more than 3500 majors in the applied statistics program at the University of Toronto. According to the past chair of the Statistics Department at University of Toronto, this program had 5000 majors at one time but then instituted a cap on enrolment.

International student demand for data science will be high. More than 65% of the students in the Data Science program at the applied statistics program at University of Toronto are international students. The Faculty of Science at York University has signed memoranda of understanding with several universities in China (Shenzhen University, Hohai University, Hubei Normal University, and Nantong University) that have expressed interest in sending their students to York to study Data Science.

York is well positioned to meet the demand from students and employers: (1) York is located in a region of rapid population increase; (2) York can leverage the nearby emerging high-tech hub in York region for its capstone course and internship and career opportunities for its graduates; (3) York’s diversity and large international student numbers will help attract more international students to data science; (4) York can leverage its existing strengths in mathematics, statistics, information technology, and computer science to offer an exceptionally high-quality program; (5) York can leverage the data science program and its research strengths in applied mathematics and AI to build an emerging research cluster in data science; and (6) York can leverage its strengths in business, health, computational arts, applied mathematics, and other areas to offer compelling streams.

4. Program Curriculum

4.1 Describe the program requirements and the ways in which the curriculum addresses the current state of the discipline or area of study. Identify any unique curriculum or program innovations or creative components.

The program requirements fall into six categories: (i) statistics; (ii) computing; (iii) mathematics; (iv) streams; (v) the capstone course; and (vi) other requirements.

(i) the statistics requirements are 27 credits over the four-year program.

1st year: Math 1130.03 (Introduction to Data Science) and Math 1131.03 (Introduction to Statistics I).

2nd year: Math 2030.03 (Elementary Probability), Math 2130.03 (Principles and Techniques of Data Science) and Math 2131.03 (Introduction to Statistics II).

3rd year: Math 3330.03 (Regression Analysis) and Math 3333.03 (Data Analytics: A Hands-on Approach).

4th year: Math 4036.03 (Introduction to Statistical Machine Learning) and Math 4931.03 (Simulation and the Monte Carlo Method).

These courses build on each other. For example, Math 2130 has Math 1130 as prerequisite. Math 3330 has Math 1131 and Math 1025 as prerequisites. Math 2131 has Math 1131, Math 2030, and Math 2015 as prerequisites.

These courses will enable the student to master the statistical methods and data techniques that enable data scientists to extract knowledge from data, and to become familiar with the nature and needs of analyzing large and complex data sets.

(ii) the computing requirements are 15 credits over the four-year program.

1st year: EECS 1015.03 (Python programming I) and EECS 1516.03 (Python Programming II).

2nd year: EECS 2011.03/ITEC 2620.03 (Data structures).

3rd year: ITEC 3221.03 (Database Management) and ITEC 3310.03 (Data Visualization).

These courses build on each other. EECS 1516.03 has EECS 1015.03 as a prerequisite.

These courses will enable the student to master computing skills and techniques that enable data scientists to extract knowledge from large and complex data.

(iii) the mathematics requirements are 15 credits in the 1st and 2nd year of the program.

1st year: Math 1013.03 and Math 1014.03 (Applied Calculus I and II). Math 1019.03 (Discrete Mathematics for Computer Science) Math 1025.03 (Applied Linear Algebra).

2nd year: Math 2015.03 (Applied Multivariate and Vector Calculus).

These courses build on each other. Math 2015 requires Math 1014, which requires Math 1013.

These courses provide the mathematical foundation needed for students to successfully complete the statistics courses. Multivariate and vector calculus is needed for Math 2131, and linear algebra is needed for Math 4036.

(iv) the stream requirements (9 credits).

Each student must choose a stream. This is a field of study outside data science in which they will gain some knowledge. Usually, the capstone course will be related to the stream. For example, a student who chooses the business stream will take business courses specified by the data science program requirements. The student's capstone course will then have to do with business data. The stream requirements vary by stream, but usually consist of three specified 3-credit courses in each of 2nd, 3rd, and 4th year. In some cases, these courses may have prerequisites which the student must take as electives or while satisfying other requirements.

(v) the capstone course

The capstone course is a 6-credit course Math 4949.06 to be taken in 4th year, and which brings together the student's statistical, computing, and stream knowledge in working on a real-life problem from industry or the public sector.

This capstone project course will provide students with hands-on experience of applying data science to real world projects. In this course, representatives from industry and other sectors will make presentations about their problems related to data science. Site visits will be arranged with interested companies or organizations to enable students to understand the workflow and environment. Students will meet people from these companies on a regular basis and report back to the instructor on their project progress. By completing this course, students will be able to apply the knowledge and skills from the data science program to projects from health care sectors, industry, and other organizations. The focus of the capstone course is on integration and application of skills obtained in the data science program to real life problems.

Students will apply their communication skills, writing skills and presentation skills acquired prior to the capstone project course. They will be trained to 1) understand the problem; 2) study the background knowledge; 3) apply appropriate data science techniques to relevant data sets; 4) communicate analysis results clearly and effectively using data visualization tools; 5) understand the limitations of analysis and ways for improvements in order to deliver a complete and practical data product.

(vi) Other requirements consist of 48 additional credits.

1st year: 6 credits in year 1 of foundational science (for BSc) or general education (for BA).

2nd year: Writing 2202.03 (Writing for Data Scientists). For BSc, 6 science credits, 3 non-science credits. For BA, 9 credits of general education.

3rd year: For BSc, 6 science credits, 6 non-science credits, and 3 elective credits. For BA, 9 general education credits and 6 elective credits.

4th year: Philosophy 3500 (Ethics for Data Science). For BSc, 9 elective credits, 3 non-science credits. For BA, 12 elective credits.

Communication is a core skill for data scientists; it is essential for effective collaboration with team members and for sharing insights provided by data science with non-specialists. WRIT 2202 introduces students to fundamental principles, skills and processes that will enable them to communicate technical information effectively for different audiences, using oral, written, and visual modes of communication. Communication components are essential aspects of many courses in the data science curriculum. PHIL 3500 is an introduction course to ethics focusing on data science specific ethics concerns with practical/real examples.

Figure 1 below presents a sample schedule for the BA and BSc degrees in data science.

HONOURS BA		
	fall term	winter term
Year 1	Math 1130 (Data Science) EECS 1015 (Python) Math 1013 (Calculus) Math 1019 (Discrete Math) NATS (Gen Ed)	Math 1131 (Statistics) EECS 1516 (Python) Math 1014 (Calculus) Math 1025 (Linear Algebra) NATS (Gen Ed)
Year 2	Math 2030 (Probability) Math 2015 (Calculus) stream course WRIT 2202 (or similar) Humanities (Gen Ed)	Math 2130 (Data Science) Math 2131 (Statistics) EECS 2011 / ITEC 2620 (Data Structures) Humanities (Gen Ed) Other (Gen Ed)
Year 3	Math 3330 (Regression) ITEC 3221 (Database Management) stream course Other (Gen Ed) elective	Math 3333 (Data Analytics) ITEC 3310 (Data Visualization) Social Sciences (Gen Ed) Social Sciences (Gen Ed) elective
Year 4	Math 4036 (Statistical Machine Learning) Math 4949 Capstone stream course PHIL 3500 (Ethics) elective	Math 4931 (Monte Carlo) Math 4949 Capstone elective elective elective

HONOURS BSc		
	fall term	winter term
Year 1	Math 1130 (Data Science)	Math 1131 (Statistics)
	EECS 1015 (Python)	EECS 1516 (Python)
	Math 1013 (Calculus)	Math 1014 (Calculus)
	Math 1019 (Discrete Math)	Math 1025 (Linear Algebra)
	foundational science	foundational science
Year 2	Math 2030 (Probability)	Math 2130 (Data Science)
	Math 2015 (Calculus)	Math 2131 (Statistics)
	stream course	EECS 2011 / ITEC 2620 (Data Structures)
	WRIT 2202 (or similar)	science credit
	non-science credit	science credit
Year 3	Math 3330 (Regression)	Math 3333 (Data Analytics)
	ITEC 3221 (Database Management)	ITEC 3310 (Data Visualization)
	stream course	science credit
	science credit	non-science credit
	non-science credit	elective
Year 4	Math 4036 (Statistical Machine Learning)	Math 4931 (Monte Carlo)
	Math 4949 Capstone	Math 4949 Capstone
	stream course	elective
	PHIL 3500 (Ethics)	non-science credit
	elective	elective

Note that in the sample schedule each course is preceded by all pre-requisites for that course. Students also have some flexibility in scheduling their courses.

4.2 Provide a list of courses that will be offered in support of the program. The list of courses must indicate the unit responsible for offering the course (including cross-lists and integrations, as appropriate), the course number, the credit value, the short course description, and whether it is an existing or new course. For existing courses, the frequency of offering should be noted. For new courses, full course proposals are required and should be included in the proposal as an appendix. (The list of courses may be organized to reflect the manner in which the courses count towards the program requirements, as appropriate, e.g., required versus optional; required from a list of specified courses; specific to certain concentrations, streams, or fields within the program, etc.)

The new required courses are Math 1130.03 (Introduction to Data Science); EECS 1516.03 (Python Programming II); Math 2130.03 (Principles and Techniques of Data Science), Writing 2202.03 (Writing for Data Science); ITEC 3221.03 (Database Management); ITEC 3310.03 (Data Visualization); Math 4036.03 (Introduction to Statistical Machine Learning); PHIL 3500.03 (Ethics for Data Science) and Math 4949.06 (Data Science Capstone course).

All the above courses except Math 1130.03 are reserved for students majoring in data science. We will encourage students qualified to enter the Data Science program to take Math 1130.03 and expect that this experience will encourage such students to enter the Data Science program and choose Data Science as a career.

The existing required courses are:

Math 1013.03 (Applied Calculus I) currently 7 sections offered in the fall, 5 in the winter, and 1 in the summer. We may have to add fall sections to support this program.

Math 1014.03 (Applied Calculus II) currently 4 sections offered in the fall, 7 in the winter, and 1 in the summer. We may have to add winter sections to support this program.

Math 1019.03 (Discrete Math for Computer Science) currently 3 sections offered in the fall, 3 in the winter, and 1 in the summer. We may have to add fall sections to support this program.

EECS 1015.03 (Python Programming) currently 2 sections offered in the fall, 0 in the winter, and 0 in the summer. We may have to add fall sections to support this program.

Math 1025.03 (Applied Linear Algebra) currently 6 sections offered in the fall, 4 in the winter, and 1 in the summer. We may have to add winter sections to support this program.

Math 1131.03 (Introduction to Statistics I) currently 2 sections offered in the fall, 2 in the winter, and 1 in the summer. We may have to add winter sections to support this program.

Math 2030.03 (Elementary Probability) currently 2 sections offered in the fall, 2 in the winter, and 1 in the summer. We may have to add fall sections to support this program.

Math 2131.03 (Introduction to Statistics II) currently 0 sections offered in the fall, 1 in the winter, and 1 in the summer. We may have to add winter sections to support this program.

Math 2015.03 (Applied Multivariate and Vector Calculus) currently 3 sections offered in the fall, 1 in the winter, and 1 in the summer. We may have to add fall sections to support this program.

EECS 2011.03 (Fundamentals of Data Structures) currently 2 sections offered in the fall, 4 in the winter, and 0 in the summer. We may have to add winter sections to support this program.

Math 3330.03 (Regression Analysis) currently 1 section offered in the fall, 0 in the winter, and 1 in the summer. We may have to add fall sections to support this program.

Math 3333.03 (Data Analytics) currently 0 sections offered in the fall, 1 in the winter, and 0 in the summer. We may have to add winter sections to support this program.

Math 4931.03 (Simulation and the Monte Carlo Method) currently 0 sections offered in the fall, 1 in the winter, and 0 in the summer. We may have to add winter sections to support this program.

Course scheduling was carefully considered in the design of the program.

Students must enroll as full-time students. The total program can be completed in four years.

4.3 Comment on the anticipated class sizes.

Based on our best information on student demand, and on the experiences of similar programs, especially the program that started in 2020 at the University of Oregon, we expect an initial cohort in 2023 of 100 students. Based on the growth rates experienced by other programs such as the University of Toronto Applied Statistics program and the UC Berkeley data science program, we expect an annual growth rate of 20%.

Therefore, we will require an additional section of every existing required course, and we will need to offer a single section of every new course. We will need a second section of each course after 4 years of growth. We expect the number of students in each stream to be low enough that no additional sections of those courses will be needed until at least 2026.

4.5 As an appendix, provide a copy of the program requirements as they will appear in the Undergraduate or Graduate Academic Calendar.

Honours Major BA Program

A. General education:

- Satisfy the general education requirement, 24 credits in total, as follows:
 - a minimum of six credits from natural science (NATS) (with no more than nine credits counting towards this requirement),
 - a minimum of six credits from the humanities category from the Faculty of Science Bachelor of Arts approved list of general education courses (with no more than nine credits counting towards this requirement),
 - a minimum of six credits from the social science category from the Faculty of Science Bachelor of Arts approved list of general education courses (with no more than nine credits counting towards this requirement).

Note: The approved list Faculty of Science Bachelor of Arts general education courses is posted on the York Courses Website.

B. Major requirements:

SC/MATH 1013.03; SC/MATH 1014.03; SC/MATH 1019.03; SC/MATH 1025.03; SC/MATH 1130.03; SC/MATH 1131.03; SC/MATH 2015.03; SC/MATH 2030.03; SC/MATH 2130.03, SC/MATH 2131.03; SC/MATH 3330.03; SC/MATH 3333.03; SC/MATH 4036.03; SC/MATH 4931.03; SC/MATH 4949.06.

LE/EECS 1015.03; LE/EECS 1516.03; LE/EECS 2011.03 or AP/ITEC 2620.03.

AP/ITEC 3221.03; AP/ITEC 3310.03.

AP/WRIT 2202.03.

AP/PHIL 3500.03

Stream requirements:

SB/MGMT 1000.03 and SB/MKTG 1030.03 and SB/FINE 2000.03 and SB/ACTG 2010.03 and SB/OMIS 2010.03

OR

HH/HLST 1010.03 and HH/HLST 1011.03 and HH/HLST 2040.03 and (HH/HLST 3350.03 or HH/HLST 3060.03 or HH/HLST 3500.03) and (HH/HLST 4310.03 or HH/HLST 4330.03)

OR

SC/MATH 2022.03 and SC/MATH 2041.03 and SC/MATH 3241.03 and SC/MATH 3090.03.

OR

SC/MATH 3171.03 and SC/MATH 3172.03 and SC/MATH 4171.03 and SC/MATH 4172.03

OR

FA/DATT 1010.03 and FA/DATT 1020.03 and FA/DATT 2300.03 and FA/DATT 2310.03

C. Upper level: a minimum of 36 credits must be at the 3000 level or above, including at least 18 credits at the 4000-level.

D. At least 18 elective credits for an overall total of 120 credits.

F. Standing requirement: to graduate in an Honours program requires successful completion of all Faculty requirements and departmental required courses and a minimum cumulative credit-weighted grade point average of 2.00 over all courses completed.

Notes:

- To obtain an Honours BA (120 credits), students must take a total of at least 18 credits at the 4000 level, including at least 12 credits at the 4000 level.

Honours BSc Major

A. General education:

- non-science requirement: 12 credits.
- mathematics: satisfied within the major requirements.
- computer science: satisfied within the major requirements.
- foundational science: six credits from SC/BIOL 1000 3.00, SC/BIOL 1001 3.00, SC/CHEM 1000 3.00, SC/CHEM 1001 3.00, SC/PHYS 1410 6.00 or SC/PHYS 1010 6.00.

B. Major requirements:

SC/MATH 1013.03; SC/MATH 1014.03; SC/MATH 1019.03; SC/MATH 1025.03; SC/MATH 1130.03; SC/MATH 1131.03; SC/MATH 2015.03; SC/MATH 2030.03; SC/MATH 2130.03; SC/MATH 2131.03; SC/MATH 3330.03; SC/MATH 3333.03; SC/MATH 4036.03; SC/MATH 4931.03; SC/MATH 4949.06.

LE/EECS 1015.03; LE/EECS 1516.03; LE/EECS 2011.03 or AP/ITEC 2620.03.

AP/ITEC 3221.03; AP/ITEC 3310.03.

AP/WRIT 2202.03.

AP/PHIL 3500.03

Stream requirements:

SB/MGMT 1000.03 and SB/MKTG 1030.03 and SB/FINE 2000.03 and SB/ACTG 2010.03 and SB/OMIS 2010.03

OR

HH/HLST 1010.03 and HH/HLST 1011.03 and HH/HLST 2040.03 and (HH/HLST 3350.03 or HH/HLST 3060.03 or HH/HLST 3500.03) and (HH/HLST 4310.03 or HH/HLST 4330.03)

OR

SC/MATH 2022.03 and SC/MATH 2041.03 and SC/MATH 3241.03 and SC/MATH 3090.03.

OR

SC/MATH 3171.03 and SC/MATH 3172.03 and SC/MATH 4171.03 and SC/MATH 4172.03

OR

FA/DATT 1010.03 and FA/DATT 1020.03 and FA/DATT 2300.03 and FA/DATT 2310.03

C. Science breadth: a total of 24 credits in science disciplines outside the major, of which at least three credits must be at the 2000 level or above. 12 of these 24 credits are satisfied by the above requirements.

D. Upper level: a minimum of 42 credits must be at the 3000 level or above.

E. Additional elective credits, as required, for an overall total of 120 credits.

F. Standing requirements: to graduate in an Honours program requires successful completion of all Faculty and Program requirements and a minimum cumulative credit-weighted grade point average of 2.30 over all courses completed.

5. Program Structure, Learning Outcomes and Assessment

The intent of this section is to provide reviewers with an understanding of the knowledge, methodologies, and skills students will have acquired by the time they complete the program (i.e., the program learning outcomes), including the appropriateness of the program learning outcomes and how they will be supported and demonstrated. With that in mind, and with explicit reference to the relevant degree level expectations, it would be useful to focus on what students in the program will know and/or be able to do by the end of a defined period and how that knowledge, methodology and/or skill will be supported and demonstrated.

5.1 Program Learning Outcomes and Assessment

a) Provide the program learning outcomes along with a description of how these are appropriate and align with the relevant degree level expectations. Programs should have eight to twelve program learning outcomes.

The Data Science program learning outcomes were developed through extensive discussions with Faculty of Science faculty, staff, industry experts, an independent higher educational consultation firm, curriculum specialists, and other leading Data Science program leaders. The Data Science team used the results of this data-gathering to help us develop the learning outcomes for this degree. The specific program learning outcomes for the Data Science program are shown below. The learning outcomes have been organized around four (4) central goals.

Data Science (BSc/BA) Program Learning Outcomes:

Graduates of the BSc/BA in Data Science program will:

Goal 1: Core Knowledge and Understanding

1.1 Explain the key concepts related to Data Science, including, but not limited to, regression analysis, data management, data visualization, data processing, data analytics, data mining, applied AI, programming languages, algorithms, web mining, machine learning, and statistical computing.

1.2 Connect Data Science components to a stream of their choice, such as Economics, Geography, Biology, Psychology, Business Administrative Studies, or Environmental Studies.

Goal 2: Critical Analysis and Decision-Making

2.1 Know the established data science techniques (theoretical foundations, acquiring, cleaning, reducing, modelling, visualizing, and storing data) and understand the trade-offs and the common pitfalls involved in applying these techniques.

2.2 Critically evaluate, and interpret Data Science information (from primary sources, census, online information, scholarly works, and in industry), develop questions, and propose actionable solutions.

2.3 Identify and analyze data science complexities when applying to stream specific models and issues.

2.4 Apply strategic thinking and propose solutions for Data Science real-world issues during coursework and Capstone experience.

Goal 3: Professional Communication

3.1 Effectively communicate data science concepts, data, procedures, and arguments through a variety of mediums (written, visual, and oral mediums) for the target audience (i.e. Peers, scientists, public and/or industry).

3.2 Work collaboratively across disciplines to address data science solutions.

Goal 4: Ethical Behaviour, Social Responsibility and Professional Capacity

4.1 Identify ethical issues and implications associated with applications of data science in a variety of settings.

4.2 Demonstrate initiative, academic integrity, personal responsibility, and accountability in the laboratory and classroom settings and when communicating their work.

Table: Summary: Ontario Undergraduate Degree Level Expectations (UUDLEs) Mapped to Data Science & Program Learning Outcomes

Undergraduate Degree Level Expectations		Data Science Learning Outcome
1. Depth and breadth of knowledge	1.Depth and Breadth of Knowledge a) General knowledge and understanding of many key concepts, methodologies, theoretical approaches and assumptions in a discipline; b) Broad understanding of some of the major fields in a discipline, including where appropriate, from an interdisciplinary perspective, and how the fields may interest with fields in related disciplines; c) Ability to gather, review, evaluate and interpret information relevant to once or more of the major fields in a discipline; d) Some detailed knowledge in an area of the discipline e) Critical thinking and analytical skills inside and outside the discipline; and f) Ability to apply learning from one or more areas outside the discipline.	1.1 Explain the key concepts related to Data Science, including, but not limited to, regression analysis, data management, data visualization, data processing, data analytics, data mining, applied AI, programming languages, algorithms, web mining, machine learning, and statistical computing. 1.2 Connect Data Science components to a stream of their choice, such as Economics, Geography, Biology, Psychology, Business Administrative Studies, or Environmental Studies. 2.2 Critically evaluate, and interpret Data Science information (from primary sources, census, online information, scholarly works, and in industry), develop questions, and propose actionable solutions. 2.3 Identify and analyze data science complexities when applying to stream specific models and issues. 2.4 Apply strategic thinking and propose solutions for Data Science real-world issues during coursework and Capstone experience.
2. Knowledge of Methodologies	An understanding of methods of enquiry or creative activity, or both, in their primary area of study that enables the student to:	

	<p>a) evaluate the appropriateness of different approaches to solving problems using well established ideas and;</p> <p>b) devise and sustain arguments or solve problems using these methods; and</p>	<p>2.1 Know the established data science techniques (theoretical foundations, acquiring, cleaning, reducing, modelling, visualizing, and storing data) and understand the trade-offs and the common pitfalls involved in applying these techniques.</p> <p>2.4 Apply strategic thinking and propose solutions for Data Science real-world issues during coursework and Capstone experience.</p>
3. Application of Knowledge	The ability to review, present and critically evaluate qualitative and quantitative information to:	
	<p>a) develop lines of argument;</p> <p>b) make sound judgments in accordance with the major theories, concepts and methods of the subject(s) of study</p> <p>The ability to use a basic range of established techniques to:</p> <p>a) analyze information</p> <p>b) evaluate appropriateness of different approaches to solving problems relates to their areas (s) of study</p> <p>c) propose solutions</p> <p>d) make use of scholarly reviews of primary sources</p>	<p>2.2 Critically evaluate, and interpret Data Science information (from primary sources, census, online information, scholarly works, and in industry), develop questions, and propose actionable solutions.</p> <p>2.3 Identify and analyze data science complexities when applying to stream specific models and issues.</p> <p>2.4 Apply strategic thinking and propose solutions for Data Science real-world issues during coursework and Capstone experience.</p>
4. Communication Skills	<p>4a. Report coherently on the results of experimental activities</p> <p>4b. Assimilate and record concepts transmitted orally or in writing</p> <p>4c. Synthesize and clearly communicate concepts to colleagues in writing and orally.</p> <p>4d. Communicate knowledge effectively to the lay public.</p>	3.1 Effectively communicate data science concepts, data, procedures, and arguments through a variety of mediums (written, visual, and oral mediums) for the target audience (i.e. Peers, scientists, public and/or industry).
5. Awareness of limits of knowledge	An understanding of the limits to their own knowledge and how this might influence analyses and interpretations.	4.1 Identify ethical issues and implications associated with applications of data science in a variety of settings, including their own limits of understanding.
6. Autonomy and Professional Capacity	Qualities and transferable skills necessary for further study, employment, community involvement and other activities requiring:	
	<p>a) the exercise of personal responsibility and decision making</p> <p>b) working effectively with others;</p>	3.2 Work collaboratively across disciplines to address data science solutions.

	c) ability to identify and address their own learning needs in changing circumstances and to select an appropriate program of further study; d) behaviour consistent with academic integrity and social responsibility.	4.2 Demonstrate initiative, academic integrity, personal responsibility, and accountability in the laboratory and classroom settings, and when communicating their work.
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b) Describe how the program curriculum and structure supports achievement of the program learning outcomes.

For undergraduate programs, comment on the nature and suitability of students' final-year academic achievement in the program.

Provide a program curriculum map to demonstrate the above. This may be an appendix to the proposal document.

The expected learning outcomes are supported via a program structure that develops students' skills and knowledge in a scaffolded manner. **Appendix F** demonstrates the learning progression by mapping how program learning outcomes are introduced, developed, achieved, and individually assessed throughout the program. In brief, students are introduced to key concepts of data science including regression analysis, data visualization, data processing, data management, data visualization, machine learning, programming languages, technical, analytic and decision-making skills, and professional communication skills starting from the first semester of the program. Emphasis will be placed on developing core knowledge leading to higher-order skills and critical understanding of data science techniques and advances. These learning outcomes will be applied, and further consolidated through each semester. The program culminates with a robust experiential capstone experience where students will have a hands-on experience of applying data science to real world projects from the health care sector, industry, and other organizations.

c) Describe how student achievement of each of the program learning outcomes is assessed, how that assessment is documented and how the methods and criteria for assessing student achievement are appropriate and effective relative to the program learning outcomes.

The program has established a detailed assurance of learning plan for the purposes of demonstrating and documenting students' performance levels with respect to the program's expected learning outcomes. Each program-level learning outcome will be measured by an individually completed final assessment embedded in specific courses throughout the curriculum. Overall, assessment in a course will be based on students' performance on various elements of the course including written assignments, examinations, project presentations, simulations, projects, group-work, and reflections. Student performance on these final assessments will be assessed against pre-established performance benchmarks, such as rubrics or success criteria. Please see Appendix G for details.

d) Describe how the program will document and demonstrate that, upon graduation, students will have achieved all degree level expectations as specified by the program learning outcomes. How will this information be used to inform continuous improvement of the program? (For more information: <https://oucqa.ca/guide/assessment-of-teaching-and-learning-2-1-6-a-and-b/>)

Documentation of students' performance levels regarding learning outcomes will be performed through York University's learning management site, e-class. This system offers robust learning outcome functionality in which outcomes can be set and aligned at both the course and program levels, and assessments can be aligned to outcomes through the use of course-specific grading rubrics. The grading of student work in e-class results in the automatic collection and compilation of data on student progress and allows for the tracking and reporting of performance levels to support the enhancement of curriculum and teaching, the identification of at-risk students and reporting requirements for accreditation processes. The performance data will serve as the basis of the program's assurance of learning plan, enable evidence-based decision-making with regards to the identification of gaps in student performance in relation to the expected learning outcomes.

Furthermore, we aim to engage registered students in a yearly survey on their learning to improve the designed learning experiences. The same will apply to relevant industry partners whose feedback on their experiences with our students will be key in informing the optimization of our program. To add to this, we plan to send out a yearly survey to our alumni investigating the type of work they are doing, how the program prepared them for their first job and for their career advancement, and any changes they might suggest for the program.

e) Include a description of the progression requirements for the degree program and the graduation requirements.

The Data Science program will follow the Senate Policy on York University Grading Schemes, which becomes effective 1 September 2023. In particular, for progression in the Data Science BSc/BA Honours program, a student must satisfy the University-wide minimum standards for progression in an Honours degree that are set out in section 4.3.a. of that policy.

Indicate if the program will be available on a part-time basis, and, if applicable, explain how students' time-to-completion will be supported and managed to ensure that the program requirements can be reasonably completed on a part-time basis.

We discourage students from taking this program on a part-time basis. However, we understand that student circumstances change, and that a full-time student might need to switch to part-time status. We will do our best to accommodate such students.

A student who is unable to complete the BSc/BA program in Data Science may be able to complete instead the 90 credit (ordinary) BSc/BA program in Applied Mathematics or a 90 credit non-major BSc degree.

5.2 Describe the proposed mode(s) of delivery, including how it/they are appropriate to and effective in supporting the program learning outcomes.

The program is in-person and course-based. We value face to face learning to build community, have shared experiences, and learn together. The nature of the coursework varies, depending on the expected learning outcomes for each course. If demand warrants, we are open to offering some classes online.

The comparator programs on page 7 of the Feasibility Study are all shown as online modality. But this is because of COVID-19. None of the comparator programs are delivered fully online. Indeed, recent research by Ashley Nahornick, Educational Development Specialist with the Faculty of Science, York University showed that the only fully online undergraduate program in Canada related to Math & Stats is the BSc in Applied Mathematics degree offered by Athabasca University.

The enrolment projections in section 8 are for in-person modality. We believe that the Data Science program will achieve its international enrolment targets due to the efforts of the Director, International Relations and Partnerships and the Science Recruiting International Coordinator in the Faculty of Science at York.

We do believe there is great potential in offering the Data Science program either fully online or hybrid. That is why we commissioned the research by Ashley Nahornick mentioned above. We are now engaging in discussions with some of the other fully online and hybrid programs in Math & Stats offered across North America to learn more.

5.3 Experiential Education

Describe the experiential components of the program, if applicable. These may include a wide variety of options, including classroom-based activities, community-based learning, or internships and co-op placements. Describe how students are supervised and assessed when participating in experiential education activities outside of the classroom.

Students will engage in several types of experiential learning throughout the program, including case analysis, teamwork, working with technologies and data sets, as well as outreach and assistance to external organizations. The program also includes a two-term, community-based data science consulting project that helps students integrate their newly acquired data science skills in a real-world setting.

Further integrated into the structure of each of the data science courses are experiential learning opportunities such as case studies, analyzing data, writing exercises, and problem-solving. For all the new data science courses being proposed, please see the course design section in the new course proposals for detailed information on experiential learning in each course. For example, Math 3330 (Regression Analysis) has a tutorial component and hands-on learning using the SAS programming language. Math 3333 (Data Analytics: A Hands-on Approach) has hands-on learning using the R programming language to perform data analytics to solve real life problems.

Students will especially engage in experiential learning in the capstone project course. This course brings together the student's statistical, computing, and stream knowledge in working on a real-life problem from industry or the public sector. In this course, students will get hands-on experience in applying data science to real world projects. Representatives from industry and other sectors will make presentations about their problems. Site visits will be arranged with interested companies or organizations to enable students to understand the workflow and environment. Students will meet with people from these companies on a regular basis and report back to the instructor. In this course, students apply their knowledge and skills to projects from the health care sector, industry, and other organizations.

6. Admission Requirements

6.1 Describe the program admission requirements, including the language proficiency requirements.

BA Requirements for admission:

- Ontario Secondary School Diploma (OSSD)
- ENG4U
- MHF4U with a grade of at least 75%
- And four additional 4U or M courses.
- MCV4U

The academic average for admission to this program should be in the high 70s to mid-80s.

BSc Requirements for admission:

- Ontario Secondary School Diploma (OSSD)
- ENG4U
- MHF4U with a grade of at least 75%
- SBI4U or SCH4U or SPH4U
- And three additional 4U or M courses.
- MCV4U

The academic average for admission to this program should be in the high 70s to mid-80s.

Students outside Ontario (or Canada) can also apply and will be considered for admission to the program if they have met equivalent requirements to those listed above for Ontario high school graduates. These equivalent requirements can also be met at college-level or university-level, including at York.

The English language proficiency requirements are those of York University. Although oral and written communication in English is a learning outcome of the course, we expect a large fraction of international students, and believe the York requirements are appropriate for admission.

ACCEPTABLE ENGLISH LANGUAGE TESTS	MINIMUM SCORE REQUIRED
TOEFL Test of English as a Foreign Language York's TOEFL code is 0894	iBT: 83
IELTS* International English Language Testing Service (Academic Module)	6.5
Pearson PTE Academic	60
Canadian Academic English Language Assessment (CAEL)	60
Cambridge English Language Assessment (CAE, CPE)	176 from C1 Advanced
Duolingo (Accepted for Summer 2021, Fall 2021 and Winter 2022 entry only)	115
*The IELTS Academic test is required for admission to York University. IELTS General will not be accepted for language proficiency requirements.	

Please note that English Proficiency tests are valid for a period of two years.

6.2. Provide a brief explanation of how these requirements are appropriate for the achievement of the program learning outcomes.

The English language proficiency requirements are those of York University. Although oral and written communication in English is a learning outcome of the course, we expect a large fraction of international students, and believe the York requirements are appropriate for admission.

MHF4U and MCV4U are pre-requisites for courses required in the fall term of 1st year.

6.3 Explain any alternative requirements, if any, for admission into an undergraduate, graduate or second-entry program, such as minimum grade point average, additional languages or portfolios, along with how the program recognizes prior work or learning experience.

Students can enter the program after already completing their first year, and still complete the program in four years. To do this, they must have taken and passed Math 1130, Math 1013/Math 1300, Math 1014/Math 1310, and EECS 1015, or courses recognized as equivalent. They must also have taken and passed at least one of Math 1131 or Math 1019 or EECS 1516. If they have not taken some of Math 1131 or Math 1019 or EECS 1516 in

first year, then they must take these courses in the fall term of their second year. If they have not taken Math 1025, then they must take this course in their second year.

Students can also enter the program after already completing some of the program requirements at York University or at another university. Such students will then have to complete the remaining program requirements and satisfy the University residency requirements. We may enter into agreements with some universities in China in which students will enter the data science program at York after completing the first one or two years at the university in China.

We expect about half of the students in the data science program to be international students. Our faculty members have many connections with universities outside Canada and lots of experience with international students, both graduate and undergraduate. Our past experience with the statistics program indicates that these international students will do well in finding suitable employment after graduating. We have held successful events for international students in the past, including presentations by international students about their successful careers after graduating from York.

7. Resources

This section provides a description of the resources available to support the delivery of the program and support of students' achievement of the program learning outcomes. In addition to the descriptions, the three tables at the end of this section provide evidence of the above.

7.1. Describe the areas of strength and expertise of the faculty who will actively participate in delivering and further developing the program, focusing on their current status and ability to foster a robust intellectual climate.

Describe plans to provide further resources that may be necessary to implement and/or sustain the program.

One of York University's greatest strengths is the wide breadth of knowledge and experience of its faculty, which includes specialists in many areas in which data science plays a role.

The resources for this program will largely be drawn from the resource base of the Department of Mathematics and Statistics, but also from the Department of Electrical Engineering and Computer Science in the Lassonde Faculty of Engineering and from the School of Information Technology in the Faculty of Liberal Arts and Professional Studies. As well, important contributions will be made by the Philosophy and Writing Departments in the Faculty of Liberal Arts and Professional Studies.

Most courses in Data Science will be taught by faculty members of the Department of Mathematics and Statistics who possess expertise in data science. In addition, the program will be enriched by experts in Statistics, Information Technology, and Computer Science.

The Statistics Section at York is home to research groups in statistics and big data, biostatistics and bioinformatics, statistical machine learning, and statistical theory and methodology.

Professor Steven Wang is an expert in machine learning, data mining, high dimensional optimization, big Data with application to medicine, disease modeling, and statistical inference. He is co-PI of a \$1.7 million grant for studying the pain of premature infants by using AI algorithms.

Professor Kevin McGregor is an expert in statistical genetics, Bayesian statistics, compositional data, analysis of microbiome data, epigenomics, and high-dimensional data. He has extensive experience in statistical consulting and the application of data science techniques in a broad range of fields.

Professor Jairo Diaz-Rodriguez has experienced the whole data science pipeline (ETL, visualization, model selection, and deployment into fully functional production systems). He combines both academia and industry worlds with top-level research and teaching experience in data science, statistics, applied mathematics, optimization, and machine learning.

7.2. Comment on the anticipated role of retired faculty and contract instructors in the delivery of the program, as appropriate.

We expect contract instructors to teach some of the required courses for the program, especially the lower-level courses that are not specifically designed for data science or statistics. These contract instructors are highly experienced professionals.

Upper-level courses and the statistics and data science courses will be delivered entirely or primarily by full-time faculty. In some rare cases, contract instructors may be able to teach such courses, but the job postings must be carefully tailored to require strong expertise in the subject area. Retired professors also are valuable teaching resources due to their lifelong experience and insight, but they are not expected to take a significant teaching role.

7.3. Where applicable, identify major laboratory facilities/studio space/equipment that will be available for use by undergraduate and/or graduate students and to support faculty research, recent acquisitions, and commitments/plans (if any) for the next five years.

We will incorporate cloud computing into our courses, using platforms like *JupyterHub* or *RStudio Cloud*. This will create a more equitable learning environment for students because powerful computing resources will be available on inexpensive tablets. We will investigate the idea of the library loaning tablets to students unable to afford them. Students in the Data Science program will become familiar with computational environments in the cloud. In addition, the Gauss computing lab (S110 Ross) has 66 seats and will be available to support the need of data science students for computing resources. The computers will be equipped with R, Python, and SAS.

7.4. Describe the office, laboratory, and general research space available that will be available for faculty, undergraduate and/or graduate students, including the availability of common rooms for faculty and graduate students, administrative space. If applicable, describe any commitments/plans for the next five years.

We have reviewed the space allocation within Math & Stats in anticipation of moving to a new building in 2025 or later, and we believe that we have enough office space for new and existing faculty and enough administrative space. Undergraduate students, including data science students, have the existing "Club Infinity" common room space.

7.5. As appropriate, comment on academic supports and services, including information technology, that directly contribute to the academic quality of the program proposed.

The primary support services will be the library, information technology services, the Faculty of Science internship and admissions services, all of which already exist and serve other programs.

The program will also rely on its advisors from industry, and the professional network of faculty members, to ensure that the program reflects the changing needs of industry as data science evolves. These networks will bring together companies who will provide high quality real-world contributions to the Math 4949 capstone course.

The capstone course Math 4949 will be a highlight of the program but scaling this ambitious course for a large and growing data science program will be challenging. This course will be first offered in 2026-2027, but we have already started thinking about how we can provide this experience to an initial cohort of 100 students, and then later to 500 students and commit to making consistent progress on scaling for the next 5 to 8 years.

If the program is highly successful, then by 2025 the program may need a support person responsible for growing and managing the corporate relationships which enable the capstone course and provide internships and employment for our students and graduates. In addition, extra TA support may be needed for courses with more experiential learning components.

We believe that the capstone course Math 4949 will be a highlight of the program but that scaling this ambitious course for a large and growing data science program will be challenging. This course will be first offered in 2026-2027 and we have already started thinking about how we can provide this experience to an initial cohort of 100 students, and then later to 500 students. We commit to making consistent progress on scaling Math 4949 for the next 5 to 8 years. If we are unable to sustain the relationships with enough community partners to adequately support the students in the capstone course, then we will fall back on using case studies, as we do currently in SC/MATH 4939.03, which is a capstone course for the Statistics program.

7.6 Describe how the available resources will support the anticipated class sizes and supervision of any experiential education activities.

Our five-year complement plan provides detailed computations of the hiring of full-time faculty that will be needed to support the Data Science program. Our careful projections of

enrolments and retirements show that we will need 2 Statistics or data science hires in 2022, 1 data science hire in 2023, 1 Statistics hire in 2024, and 1 data science hire in 2025. Experiential education will primarily occur in Math 4949, the capstone course. We will need to cap the enrolment in each section of Math 4949 because of the deep level of 1:1 supervision of students that is needed, and we are taking this into account in our projections.

7.7 Indicate whether the new program is intended to be funded or to be a full-cost recovery program.

The financial model we have developed predicts that the Data Science program will be highly profitable for York University and Faculty of Science.

7.8. Describe other indicators of the quality of the program that may not have been covered above.

8. Enrolment Projections

8.1 Indicate the anticipated implementation date (i.e., year and term of initial in-take) and provide details regarding the anticipated yearly in-take and projected steady-state enrolment target, including when steady-state will be achieved.

We plan to start the program in September 2023. Our projections assume an initial cohort of 100. This is based on the experiences of U Toronto, Oregon, and UC Berkeley and we believe it is conservative. The breakdown by stream (and therefore the breakdown into BA/BSc) is based on the data we got from Berkeley who have more than 20 different streams and enough students to gauge relative popularity of the streams. The assumptions all appear in the first column of the first table below. All the other data is calculated automatically based on a 20% annual growth rate. We believe that this growth rate is conservative based on the experiences of U Toronto, Oregon, and UC Berkeley, and even Lassonde Faculty of Engineering. We project equal numbers of domestic and international – students based on the experience at U Toronto and the fact that international students currently make up more than 40% of the undergraduate students majoring in Math and Stats.

DATA SCIENCE PROJECTED INTAKE						
	2023	2024	2025	2026	2027	2028
By Domain Emphasis:						
Business	35	42	50	60	73	87
Health	20	24	29	35	41	50
Computation	20	24	29	35	41	50
Optimization	15	18	22	26	31	37
Computational Arts	10	12	14	17	21	25
By degree type:						
BA (Hons)	45	54	65	78	93	112
BSc (Hons)	55	66	79	95	114	137
Total majors	100	120	144	173	207	249
Annual growth	20%					

DATA SCIENCE ENROLMENT BY YEAR LEVEL AND TOTALS						
	2023	2024	2025	2026	2027	2028
Year Level:						
1st	100	120	144	173	207	249
2nd	0	75	90	108	130	156
3rd	0	0	69	83	99	119
4th	0	0	0	66	79	95
graduates	0	0	0	0	64	77
Attrition Rates:						
1st/2nd	25%					
2nd/3rd	8%					
3rd/4th	4%					
4th/graduation	3%					
Total program size	100	195	303	430	516	619

Steady-state enrolment is difficult to estimate because the demand for data science graduates is likely to continue at its current rate of increase for a decade or more, and the untapped demand at University of Toronto Applied Statistics program is already at least 1,500. By 2026/27, students will be enrolled in all year levels and the size of the program will be 430. We expect the total program enrolment to increase annually by 20% after that point until exhausting untapped demand in 2032, with a program enrolment of around 1200. At that time, data science will account for over half the students whose major is in the Mathematics and Statistics department. We expect half the students to be international, and half domestic.

9. Support Statements

Support statements are required from:

- relevant Dean(s)/Principal, with respect to the adequacy of existing human (administrative and faculty), physical and financial resources necessary to support the program, as well as the commitment to any plans for new/additional resources necessary to implement and/or sustain the program
- Vice-President Academic and Provost, with respect to the adequacy of existing human (administrative and faculty), physical and financial resources necessary to support the program, as well as the commitment to any plans for new/additional resources necessary to implement and/or sustain the program
- University Librarian confirming the adequacy of library holdings and support
- University Registrar confirming the implementation schedule and any administrative arrangements
- relevant Faculties/units/programs confirming consultation on/support for the proposed program, as appropriate
- professional associations, government agencies or policy bodies with respect to the need/demand for the proposed program, as appropriate

10. Curricula Vitae of the Faculty

Current CVs should be submitted along with the new program proposal *as an independent document* compiled in a PDF document, in alphabetical order, with a table of contents. Where appropriate, a program may have separate sections for faculty members who hold full-time (including CLAs) positions at York, retirees, and adjunct appointments. CVs should be submitted in the format relevant to the proposed program.

11. List of Appendices

Appendix A: Notice of Intent BSc – BA Data Science and Response from VPA

Appendix B: New Course Proposals and Existing Course Changes

Appendix C: Course Structure

Appendix D: EAB Report on Feasibility of Bachelor's in Data Science at York University

Appendix E: Data Science Curriculum Map Spreadsheet

Appendix F: Summary of Curriculum Map

Appendix G: Program Level Learning Outcomes and Assessments

Appendix H: Mapping of UUDLES to Program Learning Outcomes

Appendix I: OIPA (Office for Institutional Planning and Analysis) Program Scan

Appendix J: Recommended Data Science Courses by Year Level

Appendix K: Letters of Support from Library

Appendix L: Potential instructors for Core Courses

Appendix M: List of Potential Reviewers

Appendix E: Honours BSc./BA Data Science Curriculum Map
 Legend: I= Introduced, D=Developed, R= Reinforced, A= Assessed Individually

Data Science Program Learning Outcomes	Year 1				Year 2								Year 3				Year 4						
	Math 1130 (Data Science)	Math 1013	Math 1019	ECSS 1015	Math 1131	Math 1014	Math 1025	ECSS 1516 (Python)	Math 2090	Math 2015	WRIT 2202	Math 2130	Math 2131	ECSS 2011 (Python not Java)	Math 3330	ITEC 3221	Math 3333	ITEC 3310	Math 4036	Math 4949 (Capstone)	PHIL 3500	Math 4931	
Goal 1: Core Knowledge and Understanding																							
1.1 Explain the key concepts related to Data Science, including, but not limited to, regression analysis, data management, data visualization, data processing, data analytics, data mining, applied AI, programming languages, algorithms, web mining, machine learning, and statistical computing.	I/A	I	I	I	I	I	I/A	D	I		D/A	D/A	D/A	R/A	R/A	R/A	R/A	R/A	R/A	R/A		R/A	
1.2 Connect Data Science components to a domain of their choice, such as Economics, Geography, Biology, Psychology, Business Administrative Studies, or Environmental Studies.															R/A					R/A	R/A		
Goal 2: Critical Analysis and Decision-Making																							
2.1 Know the established data science techniques (theoretical foundations, acquiring, cleaning, reducing, modelling, visualizing, and storing data) and understand the trade-offs and the common pitfalls involved in applying these techniques.	I/A			I/A	I		I/A	I/A			D/A	D/A	D/A	R/A	R/A	R/A	R/A	R/A	R/A	R/A		R/A	
2.2 Critically evaluate, and interpret Data Science information (from primary sources, census, online information, scholarly works, and in industry), develop questions, and propose actionable solutions.	I/A			I	I		I	I/A		D/A	D/A	D/A	D	R/A	R/A	R/A	R/A	R/A	R/A	R/A	R/A	R/A	R/A
2.3 Identify and analyze data science complexities when applying to domain specific models and issues.													D					R/A		R/A	R/A		
2.4 Apply strategic thinking and propose solutions for Data Science real-world issues during coursework and Capstone experience.	I/A						I/A			D/A	D/A		D	R/A	R	R/A	R/A	R/A	R/A	R/A		R/A	
Goal 3: Professional Communication																							
3.1 Effectively communicate data science concepts, data, and arguments through a variety of mediums (written, visual, and oral mediums) for the target audience (i.e. Peers, scientists, public and/or industry).	I/A			I	I/A	I	I/A	I/A	D	D/A	D/A	D/A	D/A	R/A	R	R/A	R/A	R/A	R/A	R/A	R/A	R/A	R/A
3.2 Work collaboratively across disciplines to address data science solutions.														D	R			R	R/A	R			
Goal 4: Ethical Behaviour, Social Responsibility and Professional Capacity																							
4.1 Identify ethical issues and implications associated with applications of data science in a variety of settings.	I/A				I		I	D/A		D/A	D/A	D/A		R	R	R/A	R/A	R/A	R/A	R/A	R/A	R/A	R/A
4.2 Demonstrate initiative, academic integrity, personal responsibility, and accountability in the laboratory and classroom settings.		I	I	I	I	I	I	D	D/A	D		D	D	R	R	R/A	R	R/A	R	R	R	R	R

FACULTY OF SCIENCE

October 5, 2021

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Re: New Program Proposal of the BSc/BA Honours in Data Science

I would like to enthusiastically express my full support for the proposed BSc/BA program in Data Science. This program will enable students to master the statistical methods, computation skills and data techniques that enable data scientists to extract knowledge from data and then to obtain meaningful employment in careers in data science.

In the past 20 years, data science has emerged as a key competence for any business. The market research commissioned for this proposal concluded that employment for data science professionals is projected to increase quickly and that York University can emerge as a dominant competitor in an untapped market. We are confident that our graduates will succeed in a job market that is high paying, fast moving, and full of interesting career opportunities.

York University is well positioned to meet the demand from students and employers. York is in a region of rapid population increase with a nearby emerging high-tech hub in York region that can contribute to its experiential capstone course and internship and career opportunities for its students and graduates. York's diversity will help attract more international students to the data science program. York's existing strengths in mathematics, statistics, information technology, and computer science will help offer a high-quality program and build an emerging research cluster in data science. York's strengths in business, health, computational arts, applied mathematics, and other areas will provide compelling domains of application for data science.

The Faculty of Science has the facilities in place to offer this program. The Faculty of Science will staff the key courses in this program with high-quality full-time faculty. Some of these faculty are in place and a search is currently being conducted for one more full-time faculty in data science.

In conclusion, I wish to express my full support for this program.

Sincerely,



Rui Wang
Dean, Faculty of Science



External Reviewers' Reports
New Programs
November 17-18, 2021

External Reviewer's Report on the BSc/BA honors degree in Data Science in the Department of
Mathematics and Statistics at York University

Reviewer

Name: Deborah Nolan

University Address: Statistics Dept, Division of Computing, Data Science, and Society, UC
Berkeley

1. OUTLINE OF THE VISIT

Was the site visit: In person: Virtual site visit: [Desk Review](#):

If the review was conducted either virtually or via desk review, was this format agreed to by both
external reviewers? Yes No

Was sufficient rationale provided by the Provost/Provost's delegate for an off-site visit?

Yes No

For those reviews that included an in-person or virtual visit, please indicate the following (or
insert the site visit schedule below:

- Who was interviewed?

SEE SCHEDULE BELOW

- What facilities were seen?

None

- Comment on any other activities relevant to the appraisal.

Not Applicable

TIME (EST)	MEETINGS	PLACE
WEDNESDAY, NOVEMBER 17, 2021.		
11:30pm - 12:00pm	Vice-Provost, Lyndon Martin	https://yorku.zoom.us/j/9127658451
12:00pm - 12:45pm	Chair of Math & Stats, Stephen Watson Statistics Director, Cindy Fu	https://yorku.zoom.us/j/99859726095
12:45pm - 1:30pm	Break	
1:30pm - 2:15pm	Key Faculty in Dept. of Math & Stats	https://yorku.zoom.us/j/99859726095
2:15pm - 2:45pm	Break	
2:45pm - 3:00pm	Associate Dean of Libraries, Research and Open Scholarship, Jack Leong; William Denton, Scholarly Analytics Librarian	https://yorku.zoom.us/j/93640830894
THURSDAY, NOVEMBER 18, 2021.		
11:30am - 12:00pm	Dean of Schulich Business School, Detlev Zwick	https://yorku.zoom.us/j/95672496555
12:00pm - 1:00pm	Break	
1:00pm - 1:30pm	Writing Chair, Andrea McKenzie Course Designer, Rosamund Woodhouse,	https://yorku.zoom.us/j/99350035630
1:30pm - 2:00pm	ITEC Chair, Sotirios Liaskos Course Designer, Enamul Prince	https://yorku.zoom.us/j/95548163236
2:00pm - 2:30pm	EECS Chair, Richard Hornsey EECS Undergrad Program Director, Suprakash Datta	https://yorku.zoom.us/j/94708176801
2:30pm - 3:00 pm	Dean of Science, Rui Wang	https://yorku.zoom.us/j/96778912031

In order to continuously improve the effectiveness and efficiency of site visits/virtual site visits, please comment on the following:

- How effective was the proposal brief in preparing you for the visit/virtual site visit?

The proposal brief was very useful in providing the details and rationale for the proposed new major program.

- How could the logistics of the visit/virtual site visit be improved?

The logistics were well planned. The length of the individual meetings were adequate for in-depth conversation. I appreciated having breaks between meetings.

2. EVALUATION CRITERIA (QAF 2.1.2)

Please provide commentary on the following evaluation criteria:

2.1 Objectives of the program (QAF 2.1.2.1)

- Are the program's [objectives](#) clearly described?

The program objectives are clearly and concisely described. The objectives include the important technical aspects of a data science education, from both the theoretical and applied perspectives. In addition, the objectives reflect key, broader goals of data science education, including the integration theory and practice, knowledge in a domain in which data science is applied, communication skills, and ethical and social responsibilities.

- Is the degree nomenclature appropriate, given the program's objectives?

The degree nomenclature is appropriate given the program's objectives.

- Are the program's objectives consistent with the institution's mission and academic plans?

The program's objectives are in alignment with York University's mission and academic plans. The field of data science has the potential to attract students with diverse interests—students who aim to use their knowledge and experience with data to build a better future for their communities, to advance social justice and equity, and to tackle global problems.

2.2 Program Requirements (QAF 2.1.2.2)

NOTE: The Quality Assurance Framework requires a clear distinction between program objectives, program-level learning outcomes, and [Degree Level Expectations](#). See the Guidance on Program Objectives and Program-level Learning Outcomes for details on the distinction.

- Is the program's structure and the requirements to meet the program objectives and program-level learning outcomes appropriate?
- Do the program's structure, requirements and program-level learning outcomes ensure students meet the institution's Undergraduate or Graduate Degree Level Expectations?
- Does the (proposed) mode of delivery facilitate students' successful completion of the program-level learning outcomes?
- Does the curriculum address the current state of the discipline or area of study?

The program is well-conceived and well-structured to meet its objectives and program-level learning outcomes. The variety of program components and how they, in combination, address the requirements and learning outcomes is carefully constructed, appropriate, and achievable.

With two degree options (BSc and BA), the program has been thoughtfully designed to accommodate a diversity of student interests, support successful completion of the program, and meet the expectations for the university's undergraduate degree.

The curriculum is an up-to-date reflection of the nascent field of data science. The program objectives address the broad aspects of a career in data science, and the collection of newly developed and existing courses have been thoughtfully designed.

The program capitalizes on existing courses across several colleges at the university. Additionally, innovative courses and curricula are under development to tackle the unique combination of statistics, computing, and domain knowledge that constitutes the new field of data science. More specifically,

- *The new course, Introduction to Data Science (Math 1130), immediately introduces students to the field in their first year of the program. This course aims to impart the core components of the data life cycle and provide a roadmap for what's to come.*
- *The new introductory course(s) in computing, communication, and ethics constitute the critical broader training needed for meeting the program goals.*
- *The proposed year-long capstone course with its direct industry experience aims to bring together the many facets of data science in a real-world setting.*

Taken together, the program prepares students for success in their careers and facilitates their successful completion of the degree and its learning outcomes.

Data science differs from the fields of computer science and statistics in its integration of the two. Traditionally separate training in statistics and computer science does not adequately capture the challenges of working with data. For example, computational considerations and familiarity gained from working with raw data often inform statistical analysis. For this reason, it's crucial for a program to offer more than separate statistics and computing components, i.e., to develop non-traditional modes of delivery and new program structures that teach this critical aspect of data science. The planned program book-ends the training with two such data science encounters via the introductory data science course and the year-long, final capstone. The program would be significantly strengthened if it also included a second or third-year course that exposes students to this critical combination.

A second-year course, after students have gained more technical skills in computing, linear algebra, statistics, and probability, would greatly assist them in learning data science. The hardest thing to teach is how to confront a data problem, and students need multiple opportunities to experience and learn these challenges. They should not wait until their final year in the program. In the reviewer's experience, data science courses can be hard to design because it requires skills/understanding that cross the multiple fields, but that's precisely why it's so crucial to offer such courses. Such courses are popular with students, and give them the confidence to engage with data.

2.3 Program requirements for graduate programs only (QAF 2.1.2.3):

Not Applicable

2.4 Assessment of teaching and learning (QAF 2.1.2.4)

NOTE: Programs should ensure that the plans for monitoring and assessing student achievement provide an assessment of students currently enrolled as well as post-graduation metrics. Please see [Guidance on Assessment of Teaching and Learning](#) for further details and examples of measures for assessing teaching and learning that meet the requirements of the Quality Assurance Framework.

- Are the methods used to assess student achievement of the program-level learning outcomes and Degree Level Expectations appropriate and effective?
- Are the plans in place to monitor and assess the following, both appropriate and effective?
 - i. The overall quality of the program;
 - ii. Whether the program is achieving in practice its proposed objectives;
 - iii. Whether its students are achieving the program-level learning outcomes; and
 - iv. How the resulting information will be documented and subsequently used to inform continuous program improvement.

The methods used to assess student achievement are appropriate and effective. Furthermore, the plans to monitor student achievement of the program-level learning outcomes are also appropriate and effective.

The program provides a scaffolded experience to develop student skills in data science, and appropriate methods of assessment are planned at various stages in this scaffolding. These are to be documented through the University's learning management site.

The Writing faculty expressed interest in engaging with the Mathematics and Statistics faculty to design opportunities to assess student achievement via writing assignments embedded in the technical courses. Additionally, the notion of a portfolio based on various assignments throughout many courses can serve students well as they graduate and go on the job market, and the portfolio offers a metric for monitoring program quality.

Goal 2 of the learning outcomes (Critical Analysis and Decision Making) is paramount to success in the field of data science, and as mentioned earlier, it can be difficult for students to gain expertise. The fourth-year capstone experience will provide a valuable opportunity to monitor student achievement. The recommended second-year opportunity will strengthen the scaffolding and provide earlier feedback.

Post-graduation plans include an annual alumni survey. To avoid over-surveying, alumni could be surveyed at particular key times after graduation, e.g. one, three, and seven years out. This would enable questionnaires designed for a particular stage in a career, reduce the survey burden, and hopefully increase response rates.

The planned feedback from industry partners has the potential to provide useful information on program quality and input for continuous improvement.

2.5 Admission Requirements (QAF 2.1.2.5)

- Are the program's admission requirements appropriate, given the program objectives and program-level learning outcomes?

The program admission requirements seem appropriate for the objectives and learning outcomes.

- Are there any applicable alternative admission requirements, including how the program recognizes prior work or learning experience, and if so, are they appropriate?

Pathways through the major are available for students who enter the program after already completing some of the program requirements at York University or at another university.

2.6 Resources (QAF 2.1.2.6)

Given the program's class sizes and cohorts as well as its program-level learning outcomes:

- a) Is the number and quality of core faculty who are competent to teach and/or supervise sufficient to achieve the goals of the program and foster the appropriate academic environment?

The Mathematics and Statistics Department, in partnership with the EECS and ITEC departments (and Philosophy and Writing), are well positioned to launch the proposed major. The five-year hiring plans have been carefully projected to build expertise in data science and statistics as the program grows. The Dean of Science has expressed support of the new major program and the resources needed to support its growth.

- b) When adjunct/sessional faculty play a large role in the delivery of the program, is their role appropriate? Are plans in place to ensure the sustainability of the program and the quality of student experience and if so, are these suitable?

Adjunct faculty from industry have the potential to bring a valuable perspective to the program.

- c) Is the provision of supervision of experiential learning opportunities adequate, if applicable?

The program plans to engage advisors from industry, as well as research faculty from across campus, in the capstone experience. This aspect of the program has tremendous potential for student career readiness, input to the department on current challenges in the field, development of valuable relationships with industry partners, and potential cross-campus partnerships on new domain emphases/streams.

- d) Taking into consideration implications for other existing programs at the university, is the administrative unit's planned use of existing human, physical and financial resources appropriate?

With plans underway for a new building to house Mathematics and Statistics, the launch of the new major program is an ideal opportunity to consider how the building might be designed to support the new modes of teaching and learning popular in data science and to create learning spaces that support students working in teams and virtual interactions.

At Berkeley, we are making plans for a new building to house the new Division of Computing, Data Science, and Society. Currently, students bring to lab their own laptops and tablets. They connect to compute power in the cloud, where the environment presents a uniform setup. Plans for the new building is to create classroom space that can readily flex between typical instruction

mode and group work, and other types of open informal space is being designed for students to work in small groups on projects and gather for tutoring sessions.

NOTE: External Reviewers are not expected to assess the financial viability of a program, and internal budgets are not under the purview of the External Review of a New Program Proposal. Provide a general assessment of the administrative unit's planned use of existing financial resources.

- e) Are there adequate resources available to sustain the quality of scholarship and research activities produced by students, including library support, information technology support, and laboratory access?

The library staff expressed support for the program. Two ideas for consideration with respect to technology support: a semester-long loan program for tablets for students who cannot afford laptops; cloud computing environments for instruction so all students have the same computing environment which they can access with a browser on a tablet.

2.7 Resources for Graduate Programs Only (QAF 2.1.2.7):

Not applicable

2.8 Quality and other indicators (QAF 2.1.2.8)

- Comment on the quality of the faculty (e.g., qualifications, funding, honours, awards, research, innovation and scholarly record, appropriateness of collective faculty expertise to contribute substantively to the program and commitment to student mentoring).

The Department of Mathematics and Statistics includes a strong Statistics group consisting of ten faculty: Diaz-Rodriguez, Fu, Gao, Jankowski, Liu, McGregor, Monette, Wang, Wong, Wu. Overall, the faculty have high quality research profiles as indicated by research awards, publications in leading journals, and supervision of PhD students.

Additionally, the faculty include those with training in both computing and statistics, experience in consulting within and external to the university, and extensive teaching experience. Most recent hires include faculty with interest in data science. The reviewer also understood that more hires in statistics and data science are currently underway and planned for the future.

- Comment on any other evidence that the program and faculty will ensure the intellectual quality of the student experience.

The Department of Mathematics and Statistics has engaged other departments and colleges in support of the proposed Data Science degree program. The Chairs of EECS, ITEC, and Writing expressed support for the program in meetings with the reviewer, and more concretely, they are developing new courses and/or adapting existing courses for data science students. Additionally, the Data Science degree program requires domain emphasis/stream in business, health, biology, or psychology (additional streams are expected to be added to the program). The Deans of Business and Science both expressed support for the Data Science degree and they plan to offer

spaces in relevant courses in order for data science majors to obtain a domain emphasis in business and biology, respectively.

3. ADDITIONAL COMMENTS

- Include any additional assessment of the New Program Proposal as a whole, as appropriate.

None

- Comment on any other issues, as applicable.

None

4. SUMMARY AND RECOMMENDATIONS

Provide a brief summary of the review. Please include commentary on any clearly innovative aspects of the proposed program together with recommendations on any essential or otherwise desirable modifications to it, as applicable.

Recommendations that are clear, concise, and actionable are the most helpful for universities as they prepare to launch new programs. Include specific steps to be taken on any essential or otherwise desirable modifications to the proposed program.

The proposal for a new BSc/BA honors degree in Data Science in the Department of Mathematics and Statistics at York University is exciting. The program is well planned and based on extensive research.

Data science is a new and rapidly growing field. Many universities are developing new programs in the field. The faculty of the Department of Mathematics and Statistics have studied several data science programs at other institutions and developed an impressive program of their own—a program that is achievable and innovative.

The faculty of the Department have collaborated with faculty in EECS, ITEC, Writing, and Philosophy to design a carefully scaffolded learning experience, where students receive training across a broad spectrum of topics related to data science: statistics, computing, ethics, and communication. Students will also gain expertise in an area of application, called a domain emphasis. And, the program training culminates in an innovative, enviable year-long capstone course.

The Mathematics and Statistics faculty have partnered effectively with other departments and colleges and schools to create clusters of courses to offer a variety of domains to majors. For example, the Schulich Business School is collaborating with the Department on a domain emphasis in business analytics. These domain emphases have tremendous potential for cross campus collaborations. The foresight to offer both a BA and BSc in data science enables students with broad interests to major in the data science and for departments from across campus to collaborate on data-centric domain emphases in business analytics, digital humanities, digital media, the environment, genomics, public health, and quantitative social science, to name a few of the possibilities.

Below are several recommendations for the modifications to the proposed program. Many have appeared earlier in the report and are collected here for convenience. The recommendations are divided into three groups: essential, desirable, and consider.

Recommendation 1 (Essential): A Second Course in Data Science. As mentioned in Section 2.2, the current program book-ends the training with two data science encounters: the introductory data science course and the year-long capstone. The program would be significantly strengthened if it also included a second or third-year course that exposes students to the critical combination of computational and statistical techniques while working directly with data. After students have gained technical skills in computing, linear algebra, statistics, and probability, they are ready to engage in data science more deeply than possible in the introductory course and well in advance of the senior capstone.

One example of such a course is Berkeley's Data 100, Principle and Techniques of Data Science (ds100.org). Evidence of the perceived value of the course is the enrollment of over 3000 students each year, which is well over the number of data science graduate (750). Additionally, students have described this course as the most important course for securing a summer internship in data science. Such a course could fit into the proposed program in the Winter Term of Year 2 in place of Math 2131.

Recommendation 2 (Desirable): Statistical Machine Learning OR Machine Learning and Pattern Recognition. With the data science field coming from the fields of statistics and computer science, there are many courses that we might hope/want our students to take. However, it's not a good use of campus resources to create a "double major" as a data science major. (Unfortunately, some universities have done this.) Rather than require both Statistical Machine Learning and Machine Learning and Pattern Recognition, the recommendation is to have students choose one of these two courses. Or, possibly, choose one from three courses – the two ML courses that are currently required and a course in, say, time series. Creating a choice enables students to take the course most closely connected to their DE, e.g., a student interested in finance would take time series. (Additionally, with the second course in data science described in Recommendation #1, several concepts from machine learning can be introduced earlier in the program.)

Recommendation 3 (Desirable): Writing Assessments. As mentioned in Section 2.4, the Writing faculty have expressed an interest in working with instructors in Statistics, EECS, and ITEC to design opportunities to assess student achievement through writing assignments embedded in technical courses.

Recommendation 4 (Consider): Cloud Computing. As the data science program launches, the Department should consider alternative lab space and technology offerings. As mentioned in Section 2.6(e), data science educators are providing students access to computational environments and resources in the cloud. This avoids the burden of software installation and maintenance, and enables students to get their work done on their own workspaces on shared resources which can be managed efficiently by system administrators. It creates a more equitable learning environment for students because powerful computing resources are available on inexpensive tablets. (And the library could loan tablets for a semester to students unable to afford them). JupyterHub and RStudio Cloud are two examples. Also, 2i2c.org offers interactive computing in the cloud to educational communities.

Recommendation 5 (Consider): Plan B for the Capstone. The capstone experience is bound to be a highlight of the program. It is an ambitious undertaking. This recommendation is to consider possibilities for a Plan B, if the original vision for the capstone proves too unwieldy.

One possibility to investigate is CMU's Corporate Capstone
<http://www.stat.cmu.edu/capstoneresearch/#corpcap>

Recommendation 6 (Consider): Annual Alumni Survey. *To avoid over-surveying, alumni could be surveyed at particular key times after graduation, e.g., one year after to determine get information about preparedness for the first job, three years out to check on career advancement, and seven years out to gain a longer term perspective. Selecting a few key times to contact alumni would enable questionnaires designed for a particular stage in a career, reduce the survey burden, and hopefully increase response rates.*

Signature: **Deborah Nolan**
Date: **December 12, 2021**



RESPONSE TO THE REVIEWER'S RECOMMENDATIONS

FACULTY OF SCIENCE

Department of Mathematics and Statistics

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Recommendation 1:

We thank the reviewer for the excellent recommendation. We add a new second-year course, Math 2130 in which students will engage in data science more deeply than in Math 1130, after gaining technical skills in computing, linear algebra, statistics, and probability. As a continuation of Math 1130, Math 2130 will strengthen the program and prepare students for upper-year ITEC, EECS, and statistics courses, and especially the capstone course Math 4949. A new course proposal is attached. We will keep Math 2131 since it is a pre-requisite course for other upper-year statistics courses including Math 4931.

Recommendation 2:

We agree that the data science major should not be a double major in computer science. We will make the change recommended by the reviewer and not require both Math 4036 and EECS 4404. However, we believe that the course learning outcomes of Math 4036 are essential for the data science program. So, the program will require MATH 4036, but make EECS 4404 optional. Creating this choice enables some students to take instead a 4th course in a subject closer to their area of interest, such as time series, experimental design, or decision models.

Recommendation 3:

We agree completely with Recommendation 3. Many of the other programs in Mathematics and Statistics have expressed strong interest in also requiring a Writing course. Indeed, the program in Actuarial Science already requires a writing course (WRIT 1702). The programs have also expressed interest in embedding writing components in other courses in Mathematics and Statistics.

We agree that it is not enough to outsource this learning outcome to the Writing department.

We will ensure that Math 1130, Math 2130 (new 2nd year data science course), Math 3330, Math 3333, ITEC 3310, Math 4036, Math 4931, and Math 4949, all require written project reports.

When a student graduates from the Data Science program, they will have assembled a portfolio of examples demonstrating their ability to collaborate with team members and share insights with non-specialists. Students can use their portfolio to demonstrate to potential employers that they can communicate



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technical information effectively to different audiences, using oral, written, and visual modes of communication. The Data Science program will also use these portfolios to help measure how well the program has achieved learning outcomes 3.1 (Effectively communicate data science concepts, data, procedures, and arguments through a variety of mediums (written, visual, and oral mediums) for the target audience (peers, scientists, public and/or industry), and 3.2 (Work collaboratively across disciplines to address data science solutions).

We will ensure that communication components are essential aspects of many courses in the data science curriculum.

Recommendation 4:

We thank the external reviewer for recommendation 4. Computer lab space will certainly constrain the size of the data space program unless we find alternative methods for students to access the necessary computational environments. Cloud computing will avoid the burden of software installation and maintenance and enable efficient management of the shared resources.

We will incorporate cloud computing into our courses, using platforms like *JupyterHub* or *RStudio Cloud*. We are especially compelled by the fact that cloud computing creates a more equitable learning environment for students because powerful computing resources will be available on inexpensive tablets. We will investigate the idea of the library loaning tablets to students unable to afford them.

As the planning for the new building proceeds, we will advocate for flexible classroom space and informal open spaces for students to work in small groups on projects.

We will ensure that in some courses in the Data Science program, students will become familiar with computational environments in the cloud.

Recommendation 5:

We agree that the capstone course Math 4949 will be a highlight of the program but that scaling this ambitious course for a large and growing data science program will be challenging. This course will be first offered in 2026-2027, but we have already started thinking about how we can provide this experience to an initial cohort of 100 students, and then later to 500 students. We commit to making consistent progress on scaling Math 4949 for the next 5 to 8 years.



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Recommendation 6:

All the Math & Stats programs should survey their alumni to learn whether these programs are adequately preparing students for their first job and for later career advancement. This is also a conclusion of our cyclical review process.

Summary of Changes to the Program Proposal:

1. Add a new required course Math 2130 in the winter term of the 2nd year.
2. Remove the requirement of EECS 4404.

Other Actions:

1. Advocate for flexible classroom space and informal open spaces for students to work in small groups on projects for the SciEng iHive.
2. Make consistent progress over the next 5 to 8 years on scaling Math 4949 to an initial cohort of 100 students in 2026/2027, and then later to 500 students.
3. Survey data science alumni to learn whether these programs are adequately preparing students for their first job and for later career advancement.
4. Ensure that communication components are essential aspects of many courses in the data science curriculum.
5. Ensure that students in the data science program become familiar with cloud computing platforms.

4 January 2022.

Stephen Watson

Dr. Stephen Watson, Professor and Chair.

April 11, 2022

Re: New Program Proposal of the BSc/BA Honours in Data Science

FACULTY OF SCIENCE

Office of the Dean

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I would like to enthusiastically express my full support for the proposed BSc/BA program in Data Science. This program will enable students to master the statistical methods, computation skills and data techniques that enable data scientists to extract knowledge from data and then to obtain meaningful employment in careers in data science.

In the past 20 years, data science has emerged as a key competence for any business. The market research commissioned for this proposal concluded that employment for data science professionals is projected to increase quickly and that York University can emerge as a dominant competitor in an untapped market. We are confident that our graduates will succeed in a job market that is high paying, fast moving, and full of interesting career opportunities.

York University is well positioned to meet the demand from students and employers. York is in a region of rapid population increase with a nearby emerging high-tech hub in York region that can contribute to its experiential capstone course and internship and career opportunities for its students and graduates. York's diversity will help attract more international students to the data science program. York's existing strengths in mathematics, statistics, information technology, and computer science will help offer a high-quality program and build an emerging research cluster in data science. York's strengths in business, health, computational arts, applied mathematics, and other areas will provide compelling domains of application for data science.

The Faculty of Science has the facilities in place to offer this program. The Faculty of Science will staff the key courses in this program with high-quality full-time faculty. Some of these faculty are in place and a search is currently being conducted for one more full-time faculty in data science.

We are delighted that the external reviewer strongly supports the Data Science program proposal and that the Department of Mathematics and Statistics agrees to implement the reviewer's recommendations. All recommendations from the reviewer are addressed below.

Recommendation 1 (Essential): We agree that adding a new second-year course in data science will strengthen the program. The Faculty of Science seeks to enhance experiential learning opportunities and access to career paths. In this second-year course, students will apply deeper mathematical and statistical techniques to data.



This will then support the experiential learning of the 4th year capstone course, and subsequent career opportunities. We are pleased that the Department of Mathematics and Statistics agrees and will add a new second-year course in data science.

Recommendation 2 (Desirable): We agree with the Department of Mathematics and Statistics that students will benefit from having the option to take courses closer to their area of interest instead of a second machine learning course. In our initial discussions with the Chair of the Department of Mathematics and Statistics, we urged that this program should not be a double major in statistics and computer science, but instead be an interdisciplinary program in which each student specializes in a domain of application such as business, economics, biology, or health. In this program, students will choose a variety of domains of application, and different 4th year courses are most applicable to those various domains. Therefore, we support giving the student the choice of the 4th year course that is most applicable to their domain. As recommended, the Department of Mathematics and Statistics has removed the requirement that each student take a second machine learning course.

Recommendation 3 (Desirable): We enthusiastically support integrating writing components across the data science curriculum. One goal of the Faculty of Science is to provide its students with the knowledge and skills they need to successfully transition into rewarding and impactful careers. This recommendation envisions that each graduating student will have a portfolio of examples that demonstrates that they can work in a team and communicate technical information effectively to a variety of audiences. We are delighted that our vision and the external Reviewer's recommendation align well. We believe that these portfolios will greatly help our students as they search for employment. We particularly support the plan of the Department of Mathematics and Statistics to embed writing components in many of its courses in support of program learning outcomes for effective communication and collaborative work.

Recommendation 4 (Consider): We believe cloud computing will help scale the program and enhance equity. The Faculty of Science seeks to ensure that diversity and accessibility are reflected in its program offerings and that we provide an equitable educational environment for all students. We are persuaded by the fact that cloud computing creates a more equitable learning environment for students because powerful computing resources will be available on inexpensive tablets. We also welcome the fact that through cloud computing the program will be available widely and not constrained by the availability of computer labs. Of course, cloud computing will also alleviate the cost of software installation and maintenance. We are pleased to see that the Department of Mathematics and Statistics accepts this recommendation.

Recommendation 5 (Consider): We understand that the capstone course will depend on establishing connections with industry so that students can work on real

problems with real data. The Faculty of Science wishes to expand its research connections and partnerships with industry and government, locally, nationally, and internationally. Therefore, we support the plans and efforts by the Department of Mathematics and Statistics to develop these partnerships, and to scale this program (and the capstone course) to many hundreds of students.

Recommendation 6 (Consider): The Faculty of Science is creating a science alumni network for mentorship, networking, and career opportunities for students and recent graduates. We expect that one of the functions of this network will be engaging with our alumni to learn how well our programs prepare students for their careers, including data science. We are pleased that the Department of Mathematics and Statistics also plans to get this feedback from its graduates.

I also wish to take this opportunity to respond to the requests from the Senate Academic Policy, Planning and Research Committee (APPRC) on March 24, 2022 at below.

(i) Incorporating cloud computing: Data Science students will use cloud computing (Azure Virtual Lab from Microsoft) beginning in the 3rd year of their program. Students will be introduced to this platform in ITEC 3221 or ITEC 3310, and then use it in MATH 4036 and the capstone course MATH 4949. For the expected enrolments, the cost per student per term is \$24. The Faculty of Science confirms its commitment to provide full financial coverage for this cost.

(ii) Space sufficiency: The Faculty of Science commits to providing office and administrative space for the additional new faculty members and staff needed for the data science program. The Faculty of Science is currently working to renovate existing space and create additional study space in the Life Science Building to serve all its students. Sufficient and adequate space will be available for the new data science students for at least the first several years, though eventually the expected demand for this program will exceed the Faculty's ability to grow enrolment without the construction of the iHive building or addition of other new space. With the advent of cloud computing, data science will make only modest additional demands on the Gauss undergraduate computing lab, and so we expect the existing lab facilities to be sufficient. We expect the existing space for the undergraduate Math & Stats students club and the Math & Stats help lab (as we turn to online help) to be adequate to serve the data science program. We expect medium-sized classrooms (150 or less) will be sufficient for the new courses and sections needed for the data science program.

(iii) Staff support for managing the corporate relationships for capstone and internships: Relationships with corporate partners, along with start-up companies, financial institutions, government agencies, and NGOs will help ensure the success of the Data Science program and sustainable growth of future enrolment. The Faculty of Science has been actively recruiting an experiential education manager and an assistant for the last one year and the search is ongoing. This added staff

capacity at the Faculty level will provide full support to the Data Science program for managing the corporate relationships that will be needed to ensure that the capstone course is successful and that internships are available for data science students after graduation.

(iv) TAs for courses with experiential learning components: We expect that the ordinary number of TA hours assigned to courses as governed by relevant collective agreements will be adequate for the experiential learning components of the courses in the program. In the program proposal, we noted especially that Math 1130, Math 2130, Math 3330, Math 3333, Math 4036, and Math 4949 will have experiential learning components.

In conclusion, I wish to express my full support for this program.

Sincerely,

A handwritten signature in black ink, appearing to read 'Rui Wang', with a horizontal line extending to the right.

Rui Wang
Dean, Faculty of Science

Memorandum

OFFICE OF THE
PROVOST & VICE-
PRESIDENT ACADEMIC

9TH FLOOR KANEFF TOWER
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To: Brenda Spotton Visano, Chair, APPRC
From: Lisa Philipps, Provost & Vice-President Academic
Date: April 22, 2022
Subject: revised response to external review of BSc/BA Honours in Data Science, Faculty of Science

I have reviewed the report of the external reviewers for the BSc/BA in Data Science and the response of the program proponent and Dean; I am satisfied that the Faculty of Science has thoughtfully addressed the comments of the reviewers.

The addition of Math 2130 will continue students' deep engagement in data science at the second year of study and help prepare them for upper-year courses in math and other areas of concentration. In eliminating the requirement that students complete a double major in computer science by taking a fourth-year course in machine learning, students will be able to take an additional course closer to their chosen domain of specialization. These refinements in the program will serve students well as they study and progress into employment in this high-demand field.

The recommendation to strengthen writing components within core courses has been enthusiastically accepted and will support the development of writing skills in the field, creating a portfolio of communication examples for specialist and non-specialist audiences. External recommendations to make use of cloud computing to accommodate demand on lab space and in noting the future challenge of scaling the ambitious capstone course to meet student numbers have been noted and will be developed over time as the first cohort of students moves through the program.

Existing space and current renovation plans ensure sufficient space for the first several years of the Data Science program, including office and administrative space for new faculty and administrative staff and lab access and study space for Data Science students. Projections for program growth, which are robust, indicate that additional space will be needed in coming years to service anticipated future enrolment. The development of the iHive Building or addition of other new space would support such growth, although it is recognized that such a project is yet several years in the future.

These refinements to the program proposal are appropriate in scope and further demonstrate the Faculty's commitment to the strength and viability of this new undergraduate degree offering. I look forward to welcoming the first cohort of Data Science students in Fall 2022 and to the growth of the program in years to come.



September 17, 2021

Prof. Stephen Watson,
Chair, Dept of Mathematics and Statistics,
York University, Toronto, Canada.

Dear Professor Watson,

I am writing to express my support for the New Program Proposal in Data Science from the Department of Mathematics and Statistics in the Faculty of Science. The Department of Electrical Engineering and Computer Science in the Lassonde School of Engineering is pleased to contribute to this program.

The EECS curriculum committee will be considering a new course proposal (EECS 1516) designed solely for the Data Science program. We expect to start offering this course to Data Science students in winter 2023-24. We also welcome students in the Data Science program to EECS 1015, starting in fall 2023-24, to EECS 2011, starting in 2024-25, and EECS 4404, starting in 2026-27.

Sincerely,

A handwritten signature in black ink that reads "Suprakash Datta".

Suprakash Datta
Vice Chair (Science),
Electrical Engineering and Computer Science Department,
Lassonde School of Engineering,
York University, Toronto, Canada.



BA/BSc program in Data Science – Consultation Letter

FACULTY OF LIBERAL
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PROFESSIONAL
STUDIES

School of Information
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The School of Information Technology had a constructive and informative consultation meeting with the proponents of the *BA/BSc in Data Science* from the Department of Mathematics and Statistics in the Faculty of Science. In an October 2020 meeting, the program proponents Stephen W. Watson, Chair of the Department of Mathematics, and Cindy Fu, Associate Professor of the Department of Mathematics presented to ITEC's Director and UPD the idea, context, rationale of the proposed program and offered us a sketch of its curricular structure. In the following period, the two teams engaged in regular exchanges exploring options for ITEC participation in the program.

ITEC is enthusiastic to begin its participation to the program with three courses:

- ITEC2620 – Data Structures, possibly in form of a variant [ITEC262X] with prerequisite structure suited for students of the program.
- ITEC3221 – Data and Information Management, [also potentially in a variant form to fit prerequisite requirements].
- ITEC3310 – Data Visualization.

The offering of the above service courses met the unanimous support of the School of IT's Curriculum Committee on Sept. 13th, 2021. Upon approval of the program, the School will proceed with the necessary adjustments and approvals to make the above courses available Fall 2024 and onwards.

The new program opens exciting possibilities for collaboration between the two units. ITEC has capability for contributing to the new program's growth with additional courses including Advanced Big Data Management, Cloud Computing, Conceptual Modeling, Data Wrangling, Process Mining and Software Development Management. In addition, ITEC is planning on developing its own Data Analytics specialization, which may come in the form of a stand-alone program, that not only is distinct and complementary in character from the proposed program (focused on infrastructure and methodology) but also opens the possibility for contribution from mathematics in the reverse direction.

Overall, the School of Information Technology is in support of the proposed program, excited to contribute with an initial list of ITEC courses and enthusiastic with the possibilities the program opens for collaboration and subsequent growth.

Sincerely Yours,

A handwritten signature in black ink, appearing to read "Sotirios Liaskos".

Sotirios Liaskos
Associate Professor, Director
School of Information Technology
York University
Email: liaskos@yorku.ca
Tel: 416-736-2100 (x33862)





September 16, 2021

Curriculum Committee
Faculty of Science

LA&PS

Writing Department
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T 647 779 8224
dba@yorku.ca

Dear Committee Members:

I am writing this letter to state my support for the New Program Proposal in Data Science from the Department of Mathematics and Statistics in the Faculty of Science. The Writing Department is pleased to contribute to this program.

We are submitting a new course proposal for WRIT 2202 and expect to start offering this course to data science students in fall 2024/25. We understand that the Faculty of Science will contribute 0.5 FCE to help develop the data science content for the course and will also contribute 0.25 FCE each year after that to provide ongoing data science expertise."

Sincerely,

A handwritten signature in blue ink, appearing to read "Andrea McKenzie", on a light blue rectangular background.

Andrea McKenzie
Chair, Writing Department





MICHAEL GIUDICE
Professor and Chair
Department of Philosophy
York University
4700 Keele St., Toronto ON
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giudice@yorku.ca

14 September 2021

Re: BA/BSc in Data Science

Dear Curriculum Committee, Faculty of Science, York University:

I am writing this letter, on behalf of the Department of Philosophy, to state our full support for the New Program Proposal in Data Science from the Department of Mathematics and Statistics in the Faculty of Science. The Department of Philosophy is pleased to contribute to this program.

We are submitting a new course proposal for a Philosophy course on Ethics for Data Scientists and expect to start offering this course to data science students in fall 2026/27.

Sincerely,

A handwritten signature in blue ink, appearing to read "Michael Giudice".

Michael Giudice, PhD





Memorandum

To: Dean of Science Rui Wang, Associate Dean of Science Mike Scheid, Professor Stephen Watson, Chair Department of Mathematics and Statistics
From: Marcia Anisette, Associate Dean Academic, Schulich School of Business
Date: September 20 2021
Subject: Proposal for New Program BSc/BA Honours in Data Science

OFFICE OF THE DEAN

Associate Dean Academic

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I am pleased to provide this letter of support on behalf of the Schulich School of Business for the New Program Proposal BSc/BA Honours Data Science from the Department of Mathematics and Statistics in the Faculty of Science. The Schulich School of Business is pleased to contribute to this program.

We will welcome those students in the Data Science program who choose Business as a domain emphasis. We expect to offer MGMT 1000, MKTG 1030, FINE 2000, OMIS 2010 and an Introductory Accounting course to Data Science students who choose Business as a domain emphasis.

We will reserve space in MGMT 1000 starting in 2023/24 and expect to offer sections of the other courses specifically for Data Science students, beginning in 2024/25. We understand that the Faculty of Science commits to make up the difference should the number of Math & Stats students enrolled in these courses fall below our break-even point. We understand that the Faculty of Science will also consult with us should the number of Data Science students who choose Business as a domain emphasis greatly exceed projections.

On behalf of the Schulich School of Business I wish the Faculty of Science every success in implementing this new program.



September 14, 2021

**SCHOOL OF THE ARTS,
MEDIA, PERFORMANCE,
AND DESIGN**

Computational Arts

Mark-David Hosale
Associate Professor, Chair

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Dear Colleagues,

I am writing this letter to state my support for the New Program Proposal in Data Science from the Department of Mathematics and Statistics in the Faculty of Science. The Department of Computational Arts in the School of Art, Media, Performance, and Design is pleased to contribute to this program. This is an exciting opportunity to explore the intersections of art, math, and science between our programs.

We will welcome those students in the data science program who choose Computational Arts as a domain emphasis. We look forward to beginning with 10 students in DATT 1010/1020 in 2023/24.

Sincerely,

A handwritten signature in black ink, appearing to read "M. D. Hosale". The signature is fluid and cursive, with the first letters of the first and last names being capitalized and prominent.

Mark-David Hosale
Associate Professor, Chair
Computational Arts
School of the Arts, Media, Performance, and Design





September 14, 2021

FACULTY OF HEALTH

School of Health Policy & Management

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As Chair of the School of Health Policy and Management and Undergraduate Program Director we are writing this letter to provide our enthusiastic support for the New Program Proposal in Data Science from the Department of Mathematics and Statistics in the Faculty of Science.

The School of Health Policy and Management is delighted at the opportunity to collaborate with Math on this exciting new initiative. This collaboration is a natural fit for the School as: (1) the new major will provide a pathway to our new graduate field/program in Health Management and Health Data Analytics and, (2) the domain emphasis in Health provides a chance to enroll a cohort of Data Science Majors who choose health as their domain emphasis in 5-9 of our undergraduate Health Studies courses, bringing analytically strong students into our program.

The School of Health Policy & Management is pleased to contribute to this program, and we will welcome those students in the data science program who choose Health as a domain emphasis. We look forward to beginning with 15 students in two of our core introductory courses HLST 1010/1011 in 2023/24.

Sincerely,

A handwritten signature in blue ink, appearing to read "Marina Morrow".

Marina Morrow, PhD
Professor & Chair

A handwritten signature in purple ink, appearing to read "Lynda Van Dreumel".

Lynda Van Dreumel
Assistant Professor
Undergraduate Program Director



Major Modifications to Existing Programs Proposal Template

Major Modifications to Existing Programs fall under Section 5 of the York University Quality Assurance Procedures (YUQAP):
<https://yuqap.info.yorku.ca/home/procedures/protocols/major-modifications-to-existing-programs/>

Major Modifications Proposal

1. Faculty: Liberal Arts & Professional Studies
2. Department: School of Administrative Studies
3. Program: Graduate program in Management
4. Degree Designation: Graduate Diploma
5. Type of Modification: (Example: deletion of or change to a field; changes to program requirements / content that affects the learning outcomes.)

Change to also offer the diploma as a Type 2 Diploma and as a Type 1 diploma with restrictions.
6. Location: (current campus and, if applicable, proposed) Markham Centre Campus
7. Effective Date: Upon Senate approval Fall 2023?

-
8. Provide a general description of the proposed changes to the program.

There are no changes to the content or learning outcomes of the Graduate Diploma in Management. A new Professional Masters program in Biotechnology is being proposed, and it includes the Graduate Diploma in Management as a requirement.

9. Provide a rationale for the changes (check wording)

The diploma is currently offered as a Type 3 standalone diploma. As a Type 2, it can be offered concurrently, thus allowing students admitted to the Masters in Biotechnology to complete the requirements for the diploma. If students complete the diploma requirements but do not complete some or all of the remaining requirements for the degree, the Graduate Diploma in Management may be **awarded as a Type 1 ("awarded when a candidate admitted to a master's program**

leaves the program after completing a certain proportion of the requirements”).

10. Comment on the alignment between the program changes with Faculty and/or University academic plans.

The Graduate Diploma in Management provides students who do not have a background in business or management to develop skills and knowledge in these areas and to access the Masters of Science in Management Practice. Making the program available as a Type 2 diploma (and Type 1 with restrictions) will allow students with an interest in Biotechnology to develop these management skills alongside graduate level Biotechnology courses, to combine these two areas in a capstone project and to further develop both areas simultaneously in an industry setting. The Masters of Biotechnology enhances cross-disciplinary thinking and exemplifies a new kind of credential “to address emergent issues and labour market needs” for 21-st Century Learning. **The proposal aligns to the LA&PS Academic Plan (2021-26) principle 2 (enhance connections and collaborations) and principle 4 (foster innovation in teaching and curriculum development).**

11. If applicable, provide a detailed outline of the changes to the program and the associated learning outcomes, including how the proposed requirements will support the achievement of program learning outcomes. **Programs should have eight to twelve program learning outcomes.** Describe how the achievement of the program learning outcomes will be assessed and how that assessment will be documented. (i.e., the mapping of the courses to the program learning outcomes; graduate outcomes).

Not Applicable

12. Summarize the consultation undertaken with relevant academic units, including commentary on the impact of the proposed changes on other programs. Provide individual statements from the relevant program(s) confirming consultation and their support.

There have been several discussions between the lead proponent of the Masters in Biotechnology and the GPD for the program over the course of the Winter 2021 term. Some of these discussions have included representation from the Office of the Provost. On May 28, a consultation was held with the Dean of Graduate Studies.

13. If applicable, describe changes to any admission requirements and on the appropriateness of the revised requirements for the achievement of the program

learning outcomes.

There are no changes to admissions requirements. Students admitted to the Masters of Biotechnology will meet existing admissions requirements for the Graduate Diploma in Management.

14. Describe any resource implications and how they are being addressed (e.g., through a reallocation of existing resources). If new/additional resources are required, provide a statement from the relevant Dean(s)/Principal confirming resources will be in place to implement the changes.

The diploma will be offered at the new Markham Centre Campus and the School of Administrative Studies is willing and able to ensure that spaces will be made available to satisfy the needs of the Masters of Biotechnology students. A separate agreement between the Deans of LAPS and Science describes the terms for the initial five years, to be renewed by mutual agreement. Deans letter of support <attached>.

15. When applicable, comment on the appropriateness of the revised mode(s) of delivery for the achievement of the program learning outcomes.

Not Applicable

16. Is the assessment of teaching and learning within the program changing? If so, comment on the appropriateness of the revised forms of assessment to the achievement of the program learning outcomes.

Assessment is not changing. However, students in the Masters of Biotechnology will complete a capstone course within the Biotechnology curriculum that satisfies the Graduate Diploma learning outcomes. This course has been developed in consultation with SAS.

17. Provide a summary of how students currently enrolled in the program will be accommodated.

Not Applicable

18. Provide the following appendices:

A) Program Learning Outcomes (eight to twelve)

B) Provide as an appendix a side-by-side comparison of the existing and proposed program requirements as they will appear in the Undergraduate or Graduate Calendar.

Not Applicable

January 17, 2022

Professor Alexander Rusetski
School of Administrative Studies
237 Atkinson College

Email: arusetsk@yorku.ca

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PROFESSIONAL STUDIES

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Dear Professor Rusetski:

Re: Decanal Support for the Major Modification to the Graduate Diploma in Management

I am pleased to provide you with a letter of support for the major modification to introduce the existing Graduate Diploma in Management as a requirement for the Master of Science in Biotechnology, offered by the Graduate Program in Biology in the Faculty of Science.

I note that there are no curricular changes to the Graduate Diploma in terms of requirements or learning outcomes. The sole change is to include the diploma in the Master of Science, which requires that it be offered as a consecutive option (Type 1) and concurrently (Type 2). Because of the nature of the proposal, no additional resources are needed to operationalize the change once it is fully approved through the University's governance procedures.

By allowing Biotechnology students the opportunity to gain a credential in management and to create more flexible options for students to complete the Graduate Diploma in Management, the major modification aligns to the principles of the University Academic Plan, 2020-25. Specifically, creating the Type 2 option for the existing Graduate Diploma supports the principles of "twenty-first century knowledge" (continually reinvent our programs to address emerging issues and labour market needs that call for new pedagogical approaches and cross-disciplinary thinking).

The major modification to the Graduate Diploma in Management also aligns to the principle of the Faculty of Liberal Arts & Professional Studies Academic Plan, 2021-26 to "offer a broad range of rigorous curricular programs that engage with emerging and longstanding local and global concerns and needs, including education for sustainable development."

In short, I support fully the major modification to the Graduate Diploma in Management to integrate it into the Master of Science in Biotechnology by creating a Type 2 (concurrent) option.

Sincerely,



J.J. McMurtry
Dean





University Policy

Senate Policy on Sessional Dates and the Scheduling of Examinations

Topic:	Class and Examination Scheduling, Academic Activities Disruption, Emergencies
Approval Authority:	Senate
Approval Date:	26 September 1996
Effective Date:	26 September 1996; proposed revisions to take effect for FW2022-2023
Last Revised:	26 May 2022 (pending)

1. Purpose

This Policy sets out the requirements regarding sessional dates and the scheduling of examinations at the University. Sessional dates refer to the permitted days of instruction, specific milestones and formal examination period within a term.

2. Applicability to All Faculties

This legislation will apply to all Faculties and programs unless otherwise noted.

3. Exceptions

Elements of this policy governing the setting of dates and schedules as expressed in **6, 7, and 9** (~~4, 5, and 6~~) will not apply to Osgoode Hall Law School, Faculty of Education (Bachelor of Education, Consecutive Program only), ~~and~~ Schulich School of Business (Master's Programs and Graduate Diplomas only) **and the Faculty of Graduate Studies.**

4. Definitions

For the purposes of this policy:

- a. **Examination shall mean an oral, written, or practical assessment that contributes toward the determination of an examination candidate's final grade or standing in the respective course, and that is scheduled by the University Registrar and time-limited.**
- b. **Formal examination period shall mean the period when formal examinations are scheduled (normally, in December, April, and August) as delineated in the Academic Year as scheduled by the University Registrar.**
- c. **Term shall mean an academic period during the calendar year. There are three Terms: Fall (September to December), Winter (January to April), and Summer (May to August). Start and end dates for each Term are published annually. Other Terms may exist at the University but are not addressed in this Policy; details may be found in program or departmental rules and regulations.**

5. Days When Classes and Examinations Will Not Be Held

Classes and examinations will not be held on public **statutory** holidays or at other times as directed by the University Senate, administration, or Board of Governors.

6. Beginning, End and Suspension Dates: Fall Term (~~effective 2018-2019~~)

The following guidelines will govern the determination of dates by the **University Registrar** for the Fall Term:

- a. Sessional dates will be scheduled to provide a ~~12-week~~ teaching term **of between 60 and 63 weekdays** (~~12 weeks of instruction~~) and an appropriate examination schedule (as defined in Section ~~68~~).
- b. Classes will begin no later than the Monday following the public **statutory** holiday of Labour Day.
- c. A minimum of one day shall be reserved for student orientation programming before classes begin, normally the Tuesday following Labour Day.
- d. Classes, examinations and tests will not be held on the weekend preceding and on the Tuesday, Wednesday, Thursday and Friday following the public **statutory** holiday of Thanksgiving. These days shall be designated Fall Reading Week.
- e. A minimum one-day study break will occur between a student's final class and their first examination in the examination period. No classes, tests or examinations shall be scheduled for a student on their study break.

7. Beginning, End and Suspension Dates: Winter Term

The following guidelines will govern the determination of dates by the **University** Registrar for the Winter Term:

- a. Sessional dates will be scheduled to provide a ~~12-week~~ teaching term of between **60 and 63 weekdays** (~~12 weeks of instruction~~) and an appropriate examination schedule (as defined in Section **78**).
- b. Classes will begin no later than the Monday following the ~~public~~ **statutory** holiday of New Year's Day.
- c. Classes, examinations and tests will not be held on the weekend preceding and on the Tuesday, Wednesday, Thursday and Friday following the ~~public~~ **statutory** holiday of Family Day. These days shall be designated as 'Winter Reading Week'.
- d. A minimum one-day study break will occur between the end of the teaching term and the start of the examination period. No classes, tests or examinations shall be scheduled on this day.

8. Beginning, End and Suspension Dates: Summer Sessions and Other Terms

The setting of dates for summer sessions and other teaching periods will be coordinated to the fullest possible extent with other terms.

9. Formal Examination Periods

Examination schedules for end of term formal examination periods will be set by the **University** Registrar in accordance with the following guidelines:

- a. Examination schedules and room allocations for examinations will be coordinated among all Faculties.
- b. Examination schedules will not overlap with teaching dates.
- c. A formal examination period should be no fewer than 14 consecutive days.**
- d. Examination schedules will be set in a manner that provides the longest interval possible between the last day of examinations in the Fall Term and the closure of the University for the December-January holidays.
- e. Examinations will be set in a manner that provides the longest interval possible between the last day of examinations and the beginning of summer sessions.
- f. Examination schedules will make the maximum use possible of available facilities and times, including evening sittings for day courses.
- g. All other guidelines and principles, will continue in effect, including the Senate Policy and Guidelines on the Conduct of Examinations and the following factors influencing the scheduling of examinations:
 - i. Students will be protected from direct examination conflicts.

- ii. Students will be protected from having to write three consecutive examinations within a 24-hour period.
- iii. There will be a maximum of three examination periods of three hours duration each day.
- iv. Special requests for exam date or time placements will be accommodated only with the approval of the designated Associate Dean of the concerned Faculty.

10. Religious Observances

York University is committed to respecting the religious beliefs and practices of all members of the community, and making accommodations for observances of special significance to adherents. The [Senate Policy, Guidelines and Procedures on Academic Accommodation for Students' Religious Observances](#) govern this matter.

11. Review

This policy shall be reviewed every five years.

Legislative history:	Approved by CCAS: 1996/06/06; Notice of Motion reported to Senate: 1996/06/26; Approved by Senate: 1996/09/26; Date Effective: 1996/09/26; supersedes Length of Term and Common Start Dates policies approved by Senate 1990/09/27 and 1990/10/25; Amended 2008/10/23; Amended 2011/06/23; Amended 2014/06/26; Amended 2017/10/26; Amended 2018/01/25
Date of next review:	2027
Policies superseded by this policy:	
Related policies, procedures and guidelines:	Pan-University Academic Nomenclature Policy, Guidelines and Procedures on Academic Accommodation for Students' Religious Observances Policy on the Limits on the Worth of Examinations in the Final Classes of a Term

Academic Policy, Planning and Research Committee

Report to Senate

At its meeting of 26 May 2022

For Information

a. Budget Context for Academic Planning: Spring Report

The Provost & Vice-President Academic and the Vice-President Finance & Administration reported to APPRC on 19 May in advance of updating Senate on the budget context for academic planning this month. Presentation slides are included with this agenda in Appendix A to this report, from which Senators Philipps and McAulay will highlight key aspects for discussion with Senate. The Committee suggested minor refinements to the presentation so as to contextualize the information provided and surface key academic planning matters for Senators.

The budget planning landscape continues to be characterized to some extent by uncertainty from the impact of the pandemic. Enrolments and tuition revenue are pressure points in this context. Against these risks, contingencies have been built into the 2022-2025 three-year budget to manage the circumstances. The Senate Committee was heartened by the news that the University remains on solid financial footing, which positions it well to address lingering challenges of the pandemic and concurrently invest in initiatives to support advancing the UAP priorities.

APPRC's review of curriculum proposals and its planning discussions with Deans this year have highlighted the critical resource issue of space sufficiency. In alignment with its mandate to advise on the allocation of academic resources, the Committee impressed upon the Provost and Vice-President Finance & Administration that identifying suitable space for new programming, the growing faculty complement, and research initiatives is increasingly an obstacle to implementing academic plans and will require careful navigation going forward. The Committee was glad to learn that dedicated funding to support student mental health services and urgent financial difficulties tied to the pandemic is sustained in the budget plan. Faculty members are reporting these remain areas of obvious need. APPRC also welcomed the review of interfaculty revenue sharing being undertaken in conjunction with the implementation of SHARP 2.0. It is hopeful the new framework when developed will address the challenges with cross-Faculty curriculum development that proponents have encountered in recent years.

The Committee looks forward to a robust discussion at the Senate meeting aided by Provost Philipps and the Vice-President McAulay. Senators are encouraged to review the material in advance.

Academic Policy, Planning and Research Committee Report to Senate (cont'd)

b. Perspectives on Planning in 2022: Report on Discussions with First Set of Deans

APPRC takes primary responsibility on behalf of Senate for the production, approval and monitoring of progress of the *University Academic Plan*. A prominent feature of the Committee's monitoring role is an annual conversation with Faculty academic planners to discuss Faculties' progress toward the University Academic Plan priorities. The input from those meetings informs the Committee's work to monitor and report to Senate on progress of the UAP. Each year, the Committee defines a framing question(s) for the decanal discussions related to Faculties' progress on the UAP goals in the current planning context.

Included among the APPRC priorities for 2021-2022 is raising awareness of how the University's teaching and research aligns with and contributes to the SDGs. The focus for the decanal discussions in 2022 therefore is Faculties' take-up of the UAP *Challenge to Contribute to the UN Sustainable Development Goals*. The Deans have been asked to speak to and engage members in a discussion of the following question:

The 2020-2025 University Academic Plan includes, alongside the six priorities, a University-Wide Challenge to Contribute to the UN Sustainable Development Goals. APPRC has responsibility for monitoring and reporting on the implementation of UAP objectives. In support of its work to raise awareness of how the University's teaching and research contributes to the SDGs and report on to Senate on progress towards the Academic Plan's objectives, APPRC requests that the Deans / Principal be prepared to discuss:

- *How the Faculty is supporting, resourcing and coordinating research strategy and curriculum planning to advance progress on SDGs*
- *How the Faculty is communicating progress on SDG-related initiatives*
- *The challenges and opportunities for the Faculty to advance local SDG plans and initiatives*

The decision was taken to divide between the spring and autumn 2022 terms the discussions with academic planners to have manageable agendas for APPRC and be able to accommodate time-sensitive items of business this term. Deans from three Faculties joined the Committee in early May to discuss progress on SDG goals, including JJ McMurtry from Liberal Arts & Professional Studies, Jane Goodyer from the Lassonde School of Engineering, and Alice Hovorka from the Faculty of Environmental & Urban Change.

The first round of planning discussions was constructive for both the Committee and the Deans. Several themes are discernable in the Faculties' strategies to contribute to the UN SDGs. The first is that SDG goals have been articulated within Faculty academic plans,

Academic Policy, Planning and Research Committee Report to Senate (cont'd)

with concrete initiatives defined within curriculum and research planning. In the case of the Faculty of Environmental & Urban Change, the SDGs are inherently aligned with the Faculty's mission and vision, and its plan tangibly weaves the development goals within all facets its academic activities. A second theme is targeted resource allocation to initiatives that support the equity-related SDG goals (5, 10, 16). The Lassonde School of Engineering's dedicated funding to advance diversity and access for students through the establishment of a Dean's Entrance Scholarship of \$110K, and new scholarships in the Faculty of Liberal Arts and Professional Studies in support of Black and Indigenous students are notable examples. The Faculties are also investing in the renewal of faculty complement to enhance diversity within the collegium. One final theme to highlight is the active communication through various media and measures that Faculties are adopting to convey the scholarship and forms of engagement being done by faculty members and students to support the SDG goals.

The variety of ways and approaches Faculties are communicating SDG-related work being done was also signalled as a key challenge for Faculties. The discussion with the Deans indicated that maximizing the ability to tell the stories about the SDG-related research and achievements at the University would be best achieved through a coordinated and resourced two-pronged Faculty-central communications strategy. APPRC observed that a coordinated strategy would be able to consider the distinct internal and external audiences to be aware of in framing these important communications, the resource challenge for small units and Faculties to have a robust communications capacity, and the reputational benefits a focused and targeted communications strategy brings to conveying the University's commitment to the SDGs and the achievements being made. An additional challenge that was touched on was defining suitable inclusive metrics by which to measure progress on SDG-related initiatives. APPRC expects this will be a thread in upcoming decanal discussions as well.

A fuller account of the planning discussions will come forward to Senate after APPRC has had the opportunity to meet with the full complement in the Fall. Additionally, APPRC will provide a report on UAP Progress in 2021-2022 to Senate in June which will include reflections and recommendations that are in part informed by the discussion with Deans.

c. Markham Campus

APPRC advised Senate last month that the Markham Campus opening is being delayed due to pandemic-related construction delays, and that consultations were being held with the four Faculties (LA&PS, AMPD, Lassonde and Science) offering programming at the new campus on the timing to launch the programs in view of the delay in opening the campus. The Deputy Provost Markham Campus, Gordon Binsted, advised APPRC at its meeting last week that two of the MC programs are planning to be delivered at the York

Academic Policy, Planning and Research Committee Report to Senate (cont'd)

University Learning Space at IBM Canada Headquarters in Markham in FW 2023-2024: the Master of Science in Management Practice (LA&PS) and the BAsC degree program in Digital Technologies (Lassonde); and that the Faculty of Science is exploring the ability to proceed in Fall 2023 with offering the new Diploma in Biotechnology. All the remaining programs planned for the Markham location will commence coincident with the launch of the campus in FW 2024.

d. Strategic repositioning of Glendon

In line with its oversight role of academic plans and major academic policies, the Committee had a preliminary discussion of the academic initiative in progress to reposition Glendon for a sustainable future. APPRC advised Senate in November about the launch of the strategic review process aimed at renewal and repositioning of Glendon's academic offerings in the current post-secondary environment. The exercise is being supported by a Principal's Advisory Committee composed of people from within and outside the Glendon community, with research and analysis provided internally by the Office of Institutional Planning and Analysis (OIPA), and externally by Nous Group, an international management consultancy with critical expertise in academic positioning.

As a reminder to Senate, the impetus for the strategic review exercise is declining enrolments at Glendon, and the need to mitigate the risk the trend poses to the College's long-term sustainability. The goal of the review is to help Glendon find solutions to address the recruitment and retention challenges. The plan to be developed by the Principal's Advisory Committee will build on the College's academic strengths and identify potential options to reposition its distinctive identity, enhance its attractiveness to prospective students, and strengthen its financial sustainability over time.

At its meeting on 5 May, APPRC was provided with and had a preliminary discussion of the emerging planning framework to redefine Glendon for a changing landscape. Consultation within the Glendon community on the strategy and proposal is in progress. An APPRC discussion of the plans with Principal Fiola is anticipated in the coming weeks to further explore the Committee's preliminary observations and questions on this important initiative.

e. Vaughan Healthcare Precinct

In accordance with its responsibility for consultations and recommendations to Senate on academic plans and major academic policies, APPRC identified among its priorities for 2021-2022 to monitor major academic planning initiatives and engage Senate in planning discussions / decisions as appropriate. One of the major initiatives in-focus this year is the Vaughan Healthcare Precinct.

Academic Policy, Planning and Research Committee Report to Senate (cont'd)

At the March meeting of Senate, APPRC facilitated consultation with Senators on the University's engagement in planning for a possible School of Medicine, including a possible alignment with the Vaughan Healthcare Precinct. Interest was expressed in these initiatives. The Provost has taken up requests from individual units and Faculty Councils to further the conversations on these initiatives to explore with the community areas of opportunity for collaboration, programming, research partnerships etc., and to gather their ideas and input.

Those discussions are continuing, including also with several external healthcare agencies and service providers, to inform planning on directions and options for the University to pursue in support of its long-held health and medical education aspirations. As a major academic initiative, APPRC will be engaged in the healthcare precinct planning and facilitating discussions with Senate at appropriate times.

Brenda Spotton Visano
Chair of APPRC



APPRC Appendix A

Multi-Year Budget Plan 2022-23 to 2024-25

MAY 26, 2022

YORK 

Budget Objectives

1. Maximize advancement of the University Academic Plan priorities
2. Ensure long-term sustainability of the University
3. Adapt to post-pandemic needs through bold thinking and responding to emerging opportunities
4. Utilize a reasonable portion of the accumulated carry forwards to invest in growth and success

	Appendix Reference	2020-21		2021-22	2022-23	2023-24
		Budget	Actuals	Budget	Budget	Budget
Operating Revenues						
Government Operating Grants	[Appendix 5]	306.3	309.9	305.9	304.7	305.8
Student Fees	[Appendix 6]	742.2	741.3	762.0	838.7	914.0
Grants and Student Fees Subtotal		1,048.5	1,051.2	1,067.9	1,143.4	1,219.9
Funding from Donations, Endowments, & Trusts		7.9	7.6	6.5	6.5	6.5
Investment Income		12.9	18.5	8.9	6.1	4.7
Other Recoveries		47.8	36.9	38.0	41.6	42.3
Total Operating Revenues		1,117.2	1,114.1	1,121.2	1,197.6	1,273.3
Contingencies						
Enrolment Contingency		(38.4)	-	(22.0)	(42.3)	(59.0)
International Tuition Offset		(16.0)	(23.6)	-	-	-
Total Contingencies		(54.4)	(23.6)	(22.0)	(42.3)	(59.0)
Total Operating Revenues, Net of Contingencies		1,062.8	1,090.5	1,099.3	1,155.3	1,214.3
Operating Expenditures						
Salaries and Wages		627.1	599.2	650.8	675.3	704.9
Employee Benefits		150.8	140.9	154.6	159.4	166.1
Operating Costs		158.2	109.8	159.4	174.0	183.7
Scholarships and Bursaries		81.0	73.3	99.7	94.3	99.4
Taxes and Utilities		24.8	18.5	26.2	26.0	27.7
Interest on Long-Term Debt		24.9	25.0	25.1	25.3	25.6
Total Operating Expenditures		1,066.9	966.7	1,115.9	1,154.3	1,207.4
In Year Surplus/(Deficit) for Operating Fund, Before Transfers		(4.1)	123.8	(16.6)	1.0	6.9
Transfers to Restricted Funds						
Transfers to Capital Fund		(51.1)	(90.5)	(42.7)	(41.2)	(48.1)
Transfers to Ancillary Fund		(3.9)	(4.6)	(4.0)	(3.4)	(3.2)
Transfers to Other Funds		(5.8)	(7.0)	(5.3)	(4.5)	(3.6)
Total Transfers to Restricted Funds		(60.9)	(102.0)	(52.0)	(49.1)	(54.8)
In Year Surplus/(Deficit) for Operating Fund, Before GAAP Adj.		(65.0)	21.8	(68.6)	(48.1)	(47.9)
GAAP Adjustments						
Remeasurement of Employee Benefit Plans		-	54.7	-	-	-
GAAP Adjustments		-	54.7	-	-	-
In Year Surplus/(Deficit) for Operating Fund		(65.0)	76.5	(68.6)	(48.1)	(47.9)
Opening Accumulated Surplus/(Deficit) for Operating Fund		240.3	240.3	316.8	206.4	200.1
Closing Accumulated Surplus/(Deficit) for Operating Fund		175.3	316.8	248.1	200.1	152.2

Current Board approved multi-year budgets – 2021-22 (in \$M)

Division	Opening Cumulative Position - ACTUAL (A)	In-Year Surplus/(Deficit) BUDGET (B)	In-Year Surplus/(Deficit) FORECAST (C)	In-year Surplus/(Deficit) VARIANCE (C-B)	Ending Cumulative Position - FORECAST (A+C)
President	4.2	(0.3)	0.6	0.9	4.8
VP Advancement	3.8	(0.3)	1.5	1.8	5.3
VP Academic					
Arts, Media, & Performance Design	(14.9)	(1.8)	(2.3)	(0.5)	(17.2)
Education	5.1	(1.9)	(1.7)	0.2	3.4
Environmental & Urban Change	(13.3)	(2.6)	(2.8)	(0.2)	(16.1)
Glendon	(20.6)	(9.2)	(11.6)	(2.4)	(32.2)
Health	18.3	(1.7)	(1.7)	0.0	16.7
Liberal Arts & Professional Studies	20.8	(4.1)	3.1	7.3	24.0
Lassonde	1.2	(1.4)	0.4	1.9	1.7
Osgoode	34.5	2.6	5.8	3.2	40.3
Schulich	(6.7)	0.6	(1.9)	(2.5)	(8.6)
Science	17.8	0.6	0.6	(0.0)	18.4
Continuing Studies	32.2	(10.4)	(11.6)	(1.2)	20.6
Total Faculties & Schools	74.6	(29.3)	(23.6)	5.7	51.0
Graduate Studies	1.1	(1.4)	(1.2)	0.2	(0.1)
Libraries	4.1	(1.2)	0.8	2.0	4.9
Vice Provost Students	10.3	(6.9)	(1.9)	5.0	8.3
PVPA	21.5	(6.6)	(5.9)	0.8	15.6
VP Academic Total	111.4	(45.4)	(31.7)	13.7	79.7
VP Equity, People and Culture	3.7	(1.5)	0.9	2.5	4.6
VP Finance & Administration	10.2	(7.9)	(5.0)	3.0	5.2
VP Research	4.7	(0.5)	1.7	2.1	6.4
Total All Divisions	138.0	(56.0)	(32.0)	24.0	106.0
Markham Campus	(0.4)	(5.8)	(3.1)	2.6	(3.6)
University Fund	50.9	(4.2)	(8.6)	(4.4)	42.3
General Institutional	128.3	(2.6)	(6.0)	(3.3)	122.4
Total University	316.8	(68.6)	(49.7)	18.9	267.0

Forecasts for 2021-22 – in \$M

The forecasts for 2021-22 were prepared in January 2022 and show results \$18.9M better than budget. As of April 2022, there are strong indications the results will be \$30M+ better than forecast, i.e. \$48.9M+ better than budget. Final actual results for 2021-22 will be available in June 2022 when the financial statements are approved.

Budget Context – concluding 2021-22

Planned strategic investments made

Positive results in 2021-22:

- Revenue in line with budget – enrolments slightly below target, buffered by the enrolment contingency
- Expenses lower than budget – cost savings due to lower travel, conferences, hospitality, campus occupancy, and some delays in hiring; offset by incremental pandemic costs e.g. screening, rapid testing, PPE, vaccination clinics, enhanced technology, and staffing supports

Significant and stable carry forwards in the Faculties and Divisions:

- \$138M at the end of 2020-21
- \$106M at the end of 2021-22 **per the forecasts prepared in January 2022**; results will be finalized in June 2022 and are expected to be \$30M+ higher


Budget Context – entering 2022-23

Continued pressures with funding from Government and tuition frameworks:

- Grants – flat, with SMA3 performance metrics tracked but not yet enforced
- Tuition fees: domestic – tuition fees frozen in 2022-23, following 10% cut in 2019-20 and freeze in both 2020-21 and 2021-22; international – the need to support international student access in 2022-23

Enrolments:

- Domestic – strong intakes in Fall 2021 and significant year-over-year growth in OUAC applications for Fall 2022
- International – intakes below target in Fall 2020 and Fall 2021 which will impact flowthrough in 2022-23 and beyond
- Continued risks related to the competitive landscape and the lingering impact of the pandemic on intake, retention, and course-loads
- Enrolment contingencies required as a precautionary measure



Multi-Year Budget Plan 2022-23, 2023-24, 2024-25

Institutional Operating Budget Summary – 2022-23 (in \$M)

	<u>2021-22</u>	<u>2022-23</u>	<u>2023-24</u>	<u>2024-25</u>		<u>2024-25</u>
	Closing Balance FORECAST	In-Year BUDGET	In-Year BUDGET	In-Year BUDGET	Total Budget for 2022-23 to 2024-25	Closing Balance BUDGET
Faculties, Schools and Divisions	106.0	(59.4)	(65.9)	(39.3)	(164.6)	(58.7)
University Fund*	42.3	23.0	58.5	60.5	142.0	184.3
Institutional Reserves	122.4	1.8	4.8	5.7	12.3	134.7
Sub Total	270.6	(34.6)	(2.7)	26.9	(10.3)	260.3
Markham Campus**	(3.6)	(10.9)	(28.7)	(18.8)	(58.4)	(62.0)
Total Operating Fund	267.0	(45.6)	(31.3)	8.2	(68.7)	198.3

* Additional allocations for strategic initiatives will be made over time

** Markham's pre-opening and early-year deficits will become in-year surpluses as enrolments ramp up on the new campus

Major assumptions

Expected cost savings based on prior year trends and experience are embedded in the multi-year budgets

1. Salaries and benefits

- Due to vacancies, annual savings against the budget between \$25M to \$52M each year since 2017-18, representing 3-7% of total budgeted salaries,
- Assume 3% in savings in each of the next three budget years = around \$28-\$29M per year

2. Travel, conference, hospitality

- In 2020-21 and 2021-22, savings of 85% and 55% against the budget
- Assume 25% in savings in 2022-23 = \$4.8M

3. Service Excellence

- Savings expected to be generated over 5 years
- For the 3 budget years, assume institutional savings are at minimum equal to investments being made in the USC = \$2.1 to \$2.9M per year

Expected savings in \$M

	2022-23	2023-24	2024-25	TOTAL
Salaries and benefits	27.7	28.2	28.8	84.8
Travel/Conf/Hosp.	4.8			4.8
Service Excellence	2.1	2.5	2.9	7.5
	34.6	30.7	31.7	97.0

Comparing 2022-23 budgets (OLD and NEW)

Revenues:

Since Board approved the 2022-23 budget in June 2021 (OLD BUDGET), the **expected revenues** for 2022-23 (NEW BUDGET) have reduced by \$29M or 2.5% due to:

	\$M
• New enrolment contracts projecting lower enrolment	(51)
• Lower tuition increase assumptions for domestic students (assumed 2% in the OLD budgets; government announced 0%)	(7)
• Lower enrolment contingencies	19
• Other revenue, e.g. investment income	10

Expenses:

Embedding the expected savings for salaries and benefits, travel/conferences/hospitality, and Service Excellence, the NEW BUDGET has reduced expenses by a similar amount to the reduction in revenues – \$30M or 2.6%

This means the in-year budget for 2022-23 has remained relatively unchanged.

Enrolment Contingencies

Due to the uncertainties remaining post-pandemic, the Faculties continue to budget significant enrolment contingencies as a precaution (in \$M):

2022-23 –	23.2
2023-24 –	46.6
2024-25 –	60.9
TOTAL –	130.7

Strategic enrolment planning continues with the Faculties to better align expenditures with revenues.

Enrolment contingencies in future years would therefore come down.

Institutional Strategic Investments

1. The carry forward has been maintained due to the prolonged effects of the pandemic on regular University operations, e.g. travel, hospitality, conferences, and campus occupancy and prudent spending
2. Opportunity to spend down positive carry forward to further advance and accelerate the UAP priorities and emerging opportunities
3. Planned in-year deficits based on:
 - strategic draw-down of positive carry forward, continuing to boldly invest while addressing and adapting to post-pandemic needs
 - incurred Markham costs through to opening and steady state
 - significant enrolment contingencies in light of international recruitment challenges
4. Reassess enrolment contingency requirements when registrations are near completion (end of summer) to determine if further acceleration or slow-downs are warranted

Operating Fund by Category in-year surplus/(deficit) – in \$M

	2021-22		2022-23	2023-24	2024-25
	Budget	Forecast	Budget	Budget	Budget
Operating Revenues					
Government Operating Grants	305.9	305.1	304.3	305.6	307.3
Student Fees	762.0	750.6	780.0	849.2	931.5
Grants and Student Fees Subtotal	1,067.9	1,055.7	1,084.3	1,154.8	1,238.8
Funding from Donations, Endowments, & Trusts	6.5	7.6	8.2	8.2	8.0
Investment Income	8.9	15.0	13.9	13.5	13.4
Other Recoveries	38.0	34.3	42.8	43.4	46.4
Total Operating Revenues	1,121.2	1,112.6	1,149.2	1,219.9	1,306.6
Enrolment Contingency	(22.0)	(22.0)	(23.2)	(46.6)	(60.9)
Total Operating Revenues, Net of Contingencies	1,099.3	1,090.7	1,126.0	1,173.3	1,245.7
Operating Expenditures					
Salaries and Wages	650.8	635.9	651.1	670.3	687.7
Employee Benefits	154.6	144.5	162.4	167.3	171.6
Operating Costs	159.4	144.9	164.0	173.4	166.7
Scholarships and Bursaries	99.7	95.5	96.6	98.2	101.9
Taxes and Utilities	26.2	23.1	24.7	26.7	27.6
Interest on Long-Term Debt	25.1	25.1	25.3	25.6	25.8
Total Operating Expenditures	1,115.9	1,069.0	1,124.1	1,161.4	1,181.3
In Year Surplus/(Deficit) for Operating Fund, Before Transfers	(16.6)	21.7	1.9	11.8	64.4
Transfers to Restricted Funds					
Transfers to Capital Fund	(42.7)	(60.9)	(38.5)	(35.2)	(49.7)
Transfers to Ancillary Fund	(4.0)	(4.2)	(4.0)	(3.6)	(3.2)
Transfers to Other Funds	(5.3)	(6.4)	(5.0)	(4.4)	(3.4)
Total Transfers to Restricted Funds	(52.0)	(71.4)	(47.4)	(43.2)	(56.3)
In Year Surplus/(Deficit) for Operating Fund	(68.6)	(49.7)	(45.6)	(31.3)	8.2
Opening Accumulated Surplus/(Deficit) for Operating Fund	316.8	316.8	267.0	221.5	190.2
Closing Accumulated Surplus/(Deficit) for Operating Fund	248.1	267.0	221.5	190.2	198.3

Priority investments in the 2022-23 Budget Plan to support the University Academic Plan

Pursuing equity, diversity and inclusion, health and wellness

Supporting the EDI Strategy, Anti-Black Racism and Indigenous Frameworks

Addressing deferred maintenance backlogs

Enhancing services through digital transformation and system innovation

Launching the Markham Centre Campus

Advancing existing and future capital projects, including the Vaughan Healthcare Precinct

Pursuing SDGs through innovative research, academic programming, and a collective focus on global well-being



Renewing and diversifying faculty complement

Investing in 21st century learning e.g., flexible and high quality digital learning, experiential education, relevant programming & credential diversification

Supporting emerging areas of research leadership

Catalyzing collaborations to promote large-scale research success

Amplifying research through growing faculty complement

Meeting diverse needs of students e.g. expanding student awards to support excellence, access, and academic progression during ongoing post-pandemic financial pressures

What we heard – Community Priorities for Investment

February 2022

(at the end of 2021-22 cycle of consultations)



February 2021

(at the end of 2020-21 cycle of consultations)



21st Century Learning, Knowledge for the Future

	<u>2021-22</u>	<u>2022/23</u>	<u>2023/24</u>	<u>2024/25</u>
New Hires				
Tenure Track	71	106	67	71
CLAs	19	13	1	0
Total	90	119	68	71
Retirements/Departures				
Tenure Track	61	34	29	23
CLAs	8	4	15	7
Total	69	38	44	30
In-Year Increase (Decrease)				
Tenure Track	10	72	38	48
CLAs	11	9	(14)	(7)
Total	21	81	24	41

NOTE: 2021-22 numbers are included for comparison purposes only. 2022-23 to 2024-25 are budgeted numbers, and do not represent current approved hires



Knowledge for the Future, SDG Challenge

- \$13.2M to support priorities in the Strategic Research Plan
 - Build on areas of interdisciplinary research strength
 - Support emerging areas of research leadership by securing large-scale funding
 - Advance Equity, Diversity and Inclusion through scholarship, research, and related creative activities
 - Create Phase 2 Catalyzing Interdisciplinary Research Clusters (CIRC) that will be focused on UN Sustainable Development Goals (SDGs)
- \$6M in bridge funding for faculty complement growth and renewal specifically pertaining to research amplification, intended to support up to 40 strategic hires



From Access to Success

- \$40M over the next 3 years to expand student financial assistance offerings and ensure they remain competitive and responsive to student needs, including:
 - Improved entrance scholarships for domestic students recognizing academic excellence
 - A higher volume of domestic and international bursaries
 - A new Tentanda Via award to students demonstrating fortitude, resilience, and a commitment to progressive and sustainable development
- An additional \$5M for international student bursaries in 2022-23, recognizing ongoing financial difficulty to access or progress with their academic programs considering the effects of the pandemic



Living Well Together

To diversify faculty complement, build capacity for research success of diverse scholars, and support York's EDI Strategy, Indigenous Framework, and Anti-Black Racism Framework :

- \$2.3M for EDI-related scholarship funding to advance Black, Indigenous, and other equity scholarship, research, and related creative activities
- \$1.9M for high priority initiatives including indigenization, reconciliation and decolonization
- Dedicated Black and Indigenous faculty hires



21st Century Learning, Living Well Together

Build an integrated IT environment that enhances service delivery, supports faculty, staff and students, and resolves complexities, by investing:

1. \$120M for a new Student System Renewal Program (SSRP) replacing outdated legacy systems – multi-year project expected to conclude in 2025-26 and funded from a combination of capital reserves (\$41M) and the central University Fund (\$79M)*
2. \$4M for automation and service improvements in HR, budgeting and forecasting, Mobile Maximo for facilities, and YU-card mobile credentials
3. Improving teaching and learning supports e.g. SAVY, classroom technology refresh
4. Enabling faculty and staff productivity and post-pandemic capabilities e.g. licensing and expanded after-hours service desk technicians, Office 365 resources, additional application and platform analysts/developers
5. \$1.2M in enhanced ongoing cybersecurity capabilities

* Alongside the development of SSRP, the resources required to successfully operate its emerging solutions, e.g. staff support, licensing, cloud technologies and infrastructure etc. are being evaluated and incorporated into multi-year budgets



Living Well Together

Investments in Deferred Maintenance

	<u>2021-22</u>	<u>2022-23</u>	<u>2023-24</u>	<u>2024-25</u>
	\$M			
Internal Funds	12.5	18.5	19.3	19.7
External Funds	5.7	6.4	5.7	5.7
TOTAL	18.2	24.8	25.0	25.4

Extending the successful Classroom and Washroom Renewal Program:

- Phase 1 originally planned for 2019-2025 was accelerated to 3 years and being completed in 2022
- Phase 2 has committed \$30M over 5 years and will commence in 2023



University Fund Commitments

	Commitments (\$M)		
	2022-23	2023-24	2024-25
Faculty Support	32.1	26.2	19.5
Research Support	7.1	3.8	2.3
Student Support *	14.2	0.9	0.9
Institutional Support **	7.3	1.3	0.9
Capital Projects and Renovations	8.0	6.0	6.0
Technology Investments	19.9	13.1	27.9
TOTAL	88.6	51.3	57.4

* Expanded student awards are paid from Faculty budgets beginning in 2023-24

** Includes \$3M for post-pandemic return-to-campus support, Congress 2023, high-priority indigenization, reconciliation, and decolonization initiatives

SHARP 2.0 – key elements being implemented in 2022-23

1. Budget Cycle and Accountability

- Enrolment planning over longer time horizon
- Multi-year budgets approved by Board each April, before entering the new fiscal year
- Service Tables for revenue-generating areas and shared services providers to discuss priorities, needs, resources, and service levels

2. Hold Harmless

- Hold Harmless amounts that were automatically provided to the Faculties based on 2013-14 replaced by transparent method of support based on current data where needed, and reviewed annually

3. University Fund

- 8% annual contributions from the revenue-generating areas (Faculties, School of Continuing Studies, Ancillary Services) for a sustainable, predictable UF to support institutional strategic priorities

4. Governance

- Two distinct Councils providing advice to the President -
 - University Fund Council* on time-limited strategic requests of Faculties and Units for University Fund support
 - Budget Council** on base budget requests of shared services Units

5. Interfaculty Revenue Sharing

- New framework being developed by a Working Group for implementation in 2023-24

*Chaired by the Provost. Membership – VPFA, VPRI, four Resource Faculty Deans representing large and small Faculties, and professional Schools

** Chaired by the President. Membership – Divisional VPs, all Resource Faculty Deans, Executive Director of the School for Continuing Studies

Long-term debt

York University has long-term debenture debt of \$600,000,000 which has been issued as follows:

- i. \$200,000,000 Senior unsecured at 6.48%, maturing March 7, 2042
- ii. \$100,000,000 Senior unsecured at 5.481%, maturing May 4, 2044
- iii. \$100,000,000 Senior unsecured at 4.46%, maturing February 26, 2054
- iv. \$100,000,000 Senior unsecured at 3.58%, maturing May 26, 2056
- v. \$100,000,000 Senior unsecured at 3.39%, maturing April 1, 2060.

In alignment with prudent sustainable fiscal management, and consistent with its fiduciary responsibility, Administration has established a voluntary, internally administered Sinking Fund from which to repay 100% of the principal of Debentures i and ii (above) at maturity. Sinking Fund value is \$86M as of April 2022.

Key Budget Risks

1. Lingering pandemic impacts and the accumulated flow-through of lower international intakes
2. Uncertainties around market share
 - Globally competitive market
 - International policies
 - Disruptive world events
 - Potential for increased domestic competition
3. Inflationary pressures, particularly escalating capital construction and renovation costs
4. Government policies, e.g. future tuition frameworks, performance-based funding, availability of funds to support sector priorities, etc.

Key Messages

1. The University is entering 2022-23 with sustained and significant carry forwards and a strong financial position
2. Utilizing a portion of the carry forward surplus, the University will continue strategically investing in the priorities of the University Academic Plan, with a view to long-term sustainability, growth, and success
3. The University is taking a cautious approach to its enrolment targets by budgeting enrolment contingencies until longer-term global impacts are better known
4. Through Service Excellence, the University will continue to identify opportunities for improved quality and efficiencies in service delivery maximizing support for the core academic priorities

Academic Policy, Planning and Research

Academic Standards, Curriculum & Pedagogy

Joint Report to Senate

At its meeting of 26 May 2022

FOR INFORMATION

a. 2020-2021 Annual Report on Non-Degree Studies

The Vice-Provost Academic, Lyndon Martin, submitted the 2020-2021 annual report on Non-Degree Studies. The Academic Policy, Planning & Research and Academic Standards, Curriculum & Pedagogy committees received and discussed the report at meetings in March and May. Vice-Provost Martin made a special effort to attend the APPRC meeting to discuss the report with the Committee.

The 2020-2025 University Academic Plan speaks to the role of continuing studies in furthering York's priorities of lifelong learning and access to post-secondary education. The most recent annual report includes information on enrolment activity in non-degree programming across the offering units, and commentary on systemic challenges and opportunities for this sector at the University. On the latter topic specifically, the Vice-Provost drew attention to the Ministry of Colleges and Universities' foray into micro-credentials with its requirement that Universities' micro-credentials programs be approved by the Province to include them in programming with OSAP eligibility. York was well-positioned to respond to the call and submitted a large collection of programs that aligned to the Ministry's measure of "career-readiness", from which it had several approved. Micro-credentials are a significant piece of the University's non-degree studies offerings and strategies are being developed.

APPRC recommended that consideration be given to including a future plans section within the annual report to assist coordination and planning among Faculties and the School of Continuing Studies. The Committee also looked to have included in upcoming reports information on non-degree courses housed in the Organized Research Units and the oversight for this programming. The 2020-2021 Annual Report is transmitted to Senate in Appendix A.

b. Report of the Joint Sub-Committee on Quality Assurance

Attached as Appendix B are two reports from the Joint Sub-Committee on Quality Assurance, one of which transmits Final Assessment Reports for completed Cyclical Program Reviews.

B. Spotton Visano, Chair, APPRC / N. Richardson, Chair, ASCP

YORK UNIVERSITY
Final Assessment Report

**International Studies, Undergraduate Program
(BA, iBA)**

Glendon College

Cyclical Program Review – 2012 to 2020

This Final Assessment Report (FAR) provides a synthesis of the cyclical review of the programs listed below.

Program(s) Reviewed:

BA, iBA

Reviewers appointed by the Vice-Provost Academic:

Dr. Talbot Charles Imlay, Professor, Département des sciences historiques, Université Laval, Québec

Dr. David Leyton-Brown, Professor Emeritus, Department of Politics, Faculty of Liberal Arts and Professional Studies, York University

Cyclical Program Review Key Milestones:

Cyclical Program Review launch: September 19, 2019

Self-study submitted to Vice-Provost Academic: February 17, 2021

Date of the Site Visit: May 27, 2021

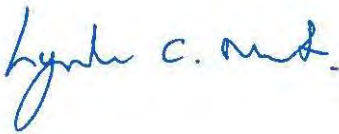
Review Report received: July 8, 2021

Program Response received: October 2021

Dean's Response received: January 2022

Implementation Plan and FAR confirmed by Joint Sub-Committee on Quality Assurance, March 2022.

Follow-up Report due October 2023.



Lyndon Martin, Vice-Provost Academic, York University

This review was conducted under the York University Quality Assurance Protocol, August 2013.

SITE VISIT: May 27, 2021

The virtual site visit was organized around a set of interviews with York University and Glendon colleagues, including Lyndon Martin, Vice Provost Academic, Marco Fiola, Principal, Glendon College, Hossam Ali-Hassan, Chair and Undergraduate Program Director, full-time and part-time faculty members, and undergraduate students.

In addition, the external reviewers met with two librarians, Jack Leong Associate Dean, Research & Open Scholarship and Patti Ryan, Director, Content Development and Analysis.

On June 10 the reviewers had an online meeting with two faculty members currently seconded to the Department of Sociology but scheduled to return to International Studies in the next academic year.

OUTCOME:

The Joint Sub-Committee on Quality Assurance received the Final Assessment Report and Implementation Plan and was assured that all the required elements of the Cyclical Program Review had been successfully completed, although with some understandable delays due to the Covid 19 Pandemic.

A report on the progress of the initiatives undertaken in response to recommendations in general and as specified in the implementation plan will be provided in the Follow-up Report which will be due in 18 months (October 2023).

The next cyclical program review will launch in the Fall of 2027 with a site visit expected in Fall of 2028 or Winter of 2029.

PROGRAM DESCRIPTION AND STRENGTHS:

In 1968, the Senate of York University approved the granting of a Bachelor of Arts (BA) degree in International Studies at Glendon College, the only one in Canada. In September 2011, the now Department of International Studies re-examined its academic program and introduced the concept of three thematic pillars that not only touch on fundamental issues in international society, but also strengthen the program's interdisciplinary approach and identity.

In July 2016, the presidents of York University and Emlyon Business School in St. Etienne, France signed a document launching a collaboration between the two institutions, which introduced a dual degree program. The Dual Degree program with Emlyon Business School in France leads to an iBA in International Studies from York University and a Bachelor of Business Administration (BBA) from Emlyon.

The International Studies Program (ISP) at Glendon Campus appears to be at something of a crossroads. The reviewers noted, "As it now stands, the International Studies Program is strongly tilted towards international business, a tilt reflected in recent

faculty hires as well as in the dual degree with business. The prominent place given to business studies appears to have been the result of circumstance (and opportunity) and less the result of planning. One result is that the relationship between business studies and international studies more generally is a fraught one.”

The reviewers noted that the location of Glendon is ideal for experiential education, and there is strong student interest in internships, co-ops, placements, and community-based and community-service learning. Glendon has established supports for the identification and nurturing of partnerships to enable these opportunities to grow.

There are opportunities for cross department and cross-program collaborations to enhance the course offerings for International Studies students.

Recommendation 1

That the department redesign collectively the curricular content of the program and its streams, paying attention to all the questions raised in the Review Report (Section 7, paragraph 3). Key questions include:

- What is the essential curriculum needed to support three streams, with a defined sequence of introductory and advanced required courses for the program as a whole and each of the three “thematic pillars”, together with a manageable number and variety of elective courses in each stream?
- What is the relationship between the dual degree program and the International Studies program (that is between international business and international studies)? (*See also Recommendation 2*)
- What faculty resources are needed to deliver that essential curriculum, taking into account sabbaticals and research or administrative releases or teaching in other programs of full-time faculty, and an assured number of part-time course directorships?

Program Response

The program agrees with the recommendation to redesign collectively the curricular content of the program. The program believes this will allow us to attract more students and retain them. The program acknowledges that it doesn’t offer the essential curriculum, with the necessary introductory and advanced required courses, needed to support three thematic pillars described in the program. While some members of the department believe that the three streams should be retained, a larger group prefers to adopt the suggestion for keeping two themes represented by two programs: the International Studies and the Dual Degree in ILST and business administration with Emlyon.

The program may develop themes that emerge from broad, ongoing discussions about curriculum redesign.

In October 2021 the department agreed to start the process of curriculum redesign during the current academic year, identifying faculty resources that are needed to deliver that essential curriculum, as well as available resources at Glendon such as potential courses to cross-list and potential faculty cross-appointments (please also see our response to Recommendation 5).

Principal's Response

The Principal agrees that presenting the program as having three or more different possible themes to students, without being able to fulfill that promise, is not sustainable. He agrees with the reviewers that the program must be streamlined, and the pathways simplified for the sake of students and of program management. The course offering needs to be reviewed in light of the current resources and of its commitment to host the dual degree.

Recommendation 2

Consider alternate structures for the program and the department. (Review Report, Section 3, bullet-point 5)

Program Response

The Department of International Studies agrees that its small size makes it difficult to offer sufficient courses and contribute significantly to initiatives and events that would enhance its programs and offerings to students. Being part of a larger entity could resolve this problem. Discussions were begun in 2020 but discontinued in 2021. However, the department remains open to restructuring initiatives that would allow us to merge with compatible and complementary departments as part of a larger entity, recognizing the challenges that could make it difficult to ensure the necessary required courses and elective courses are offered.

Principal's Response

The Principal agrees with the Department's response and while there are currently discussions about merging a number of units, they do not involve the elimination of International Studies, but instead the addition of faculty members to the existing Department of International Studies. Should these discussions be positive for all those involved, the name of this unit would remain to be decided. However, with more faculty members with fields of expertise akin to International Studies – in its strict sense or more broadly understood - under one single umbrella, it is anticipated that more opportunities for interdisciplinary collaborations would surface or become available.

Recommendation 3

That the contract faculty be included in discussions about program restructuring. (Review Report, Section 7, Paragraph 3)

Program Response

The department of International Studies acknowledges and values the contribution of part-time faculty members to the ILST program. The department has decided that part-time faculty members will be invited to future meetings as non-voting attendees, so they are informed of developments affecting the program and their courses and to contribute to the discussions.

Principal's Response

This is an excellent suggestion from reviewers, and an appropriate response from the program.

Recommendation 4

There should be Glendon or York central administrative support for the substantial expansion of experiential education opportunities for students in the International Studies program, especially internships.

Program Response

The Department acknowledge the importance of experiential education, such as internships, for the International Studies program and is pleased that a new office for experiential education was set up at Glendon (<https://www.glendon.yorku.ca/experiential-education/>). The Department is working with that office to coordinate student internships as part of the ILST4300 (Professional Internship) course. The Department notes the commitment to experiential education by the Associate Principal Academic ensuring that faculty members responsible for courses like ILST4300 to be more active in connecting with potential employers and building a central database of internship.

Principal's Response

The Principal welcomes this recommendation and is ready to take it as a call to action for more efforts being deployed for experiential education in general, but specifically for programs – like the BA in International Studies – with an internship component.

Recommendation 5

Opportunities should be explored to increase the number of courses available to students in the program, and the number of faculty teaching in the program (e.g., cross-listing, cross-appointments, academic restructuring, etc.)

Program Response

The Department fully endorses this recommendation. The Department is interested in cross-listing and cross-appointments but specifically those which enhance the unique interdisciplinary character of the International Studies program. The Department is interested in cross-listing and cross-affiliations with faculty in the humanities, including history, philosophy, and literature, as well as other interdisciplinary studies programmes like Canadian Studies. In addition, cross-listing and cross-affiliations with programs like

Economics, Political Science and Sociology are of interest. Exploration of these will begin in 2021-2022.

Principal's Response

The Principal fully supports this recommendation and the initiatives taken thus far to that end.

IMPLEMENTATION PLAN

The chart below lays out the implementation plan approved by the Joint Sub-Committee at its meeting in March 2022

Recommendation	Action	Responsible for Follow-up	Timeline
1. That the department redesign aspects of the International Studies program.	Reduce the number of themes in the program to two.	Associate Principal Academic; Chair of Department	Curriculum development complete by Summer 2022; implementation for Fall 2023
2. That alternate structures for the program and department be considered.	Hold open discussions about structures and revisit name if appropriate.	Associate Principal Academic, Chair of International Studies, Director of the Glendon School of Public and International Affairs, Coordinator of the MA in Public and International Affairs, Chair of Sociology, Coordinator of Canadian Studies, Chair of Political Science, Coordinator of the Communications program	Complete no later than Spring 2023
3. That the contract faculty be included in discussions about program restructuring.	Consider formalization of part-time instructor participation.	Chair of Department/Program Coordinator	April 2022
4. That administrative support for experiential education be made available.	That the department work closely with the Glendon Department of Experiential Education.	Chair of Department/Program Coordinator, Office of Experiential Education, Director of Advancement and Alumni Relations	Ongoing
5. That exploration of opportunities to increase the number of courses available in the major be undertaken.	Identify barriers to cross-listing of courses and cross-affiliations; work to alleviate these in the short and medium term.	Associate Principal Academic, Program Coordinator, Chairs and Coordinators of interested Departments and Programs.	Spring 2023, and ongoing

YORK UNIVERSITY
Final Assessment Report

**SCIENCE AND TECHNOLOGY
STUDIES**
Faculty of Science

**Science and Technology Studies
Undergraduate Program (BA and BSc)**

Cyclical Program Review – 2009 to 2016

This Final Assessment Report (FAR) provides a synthesis of the cyclical review of the programs listed below.

Program(s) Reviewed:

BA – Honours, 90-credit

BSc – Specialized Honours, 90 credit

Honours minor

Reviewers appointed by the Vice-Provost Academic:

Dr. Alberto Cambrosio, Department of Social Studies of Medicine, McGill University, CA

Dr. Hannah Landecker, Department of Sociology & Centre for Genetics and Society, University of California (UCLA), USA

Dr. Spiros Pagiatakis, Associate Dean, Research & Graduate Studies, Lassonde School of Engineering, York University

Cyclical Program Review Key Milestones:

Cyclical Program Review launch: September 15, 2016

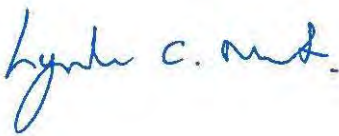
Self-study submitted to Vice-Provost Academic: August 9, 2017

Date of the Site Visit: October 24-25, 2017

Review Report received: November 16, 2017

Final Assessment Report and Implementation Plan received by the Joint Subcommittee on Quality Assurance, March 2022.

Follow-up Report due October 2023.

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Lyndon Martin, Vice-Provost Academic, York University.

This review was conducted under the York University Quality Assurance Protocol, August 2013.

SITE VISIT: October 24-25, 2017

The reviewers met with Alice Pitt, Vice-Provost Academic and Fahim Quadir, Interim Dean, Faculty of Graduate Studies. In addition, the reviewers met with all of the Deans involved with the STS program, Ray Jayawardhana, Dean, Faculty of Science, Alex Mills, Associate Dean Students, Faculty of Science, Ananya Mukherjee-Reed, Dean, Liberal Arts and Professional Studies, Sylvie Moran, Associate Dean of Research, Faculty of Science, Buks Van Rensberg, Associate Dean of Faculty, Faculty of Science.

Interviews were held with faculty members involved in the STS program: Kenton Kroker, STS Chair, STS Faculty (group interview, 5 members), Ernst Hamm, former STS Chair, other STS scholars at York (group interview: 5 members), Kean Birch, STS Graduate Program Director, John Dupuis and Genny Jon, Librarians, STS Graduate Program Faculty Members (group interview: approx. 10-15 faculty members, coming and going).

A few faculty members who could not be present because of other academic commitments emailed submissions to the reviewers.

Student participation in the site visit was robust. The reviewers met with the following graduate and undergraduate students: the STS Graduate Students (group interview: approx. 35-40 students) and the STS UG Majors/Minors students (group interview: 5 students). The reviewers noted that the most impressive meeting, both in terms of attendance and of issues raised, was with graduate students, who provided an open letter signed by 40 out of 47 graduate students, and a large number of individual letters that provided additional detail.

OUTCOME

The Vice-Provost Academic, upon receipt of the External Review Report, determined that regular process of a cyclical program review could not proceed, and the programs would not be asked to respond to recommendations. The Provost's Office assumed responsibility for working with deans, faculty and students to organize a facilitated process for discussing the programs' challenges, exploring solutions and developing a path forward.

A report on the progress of the initiatives undertaken in response to recommendations in general and as specified in the implementation plan will be provided in the Follow-up Report which will be due in 18 months (October 2023).

The next cyclical program review will launch in Fall of 2024 with a site visit expected in Fall of 2025 or Winter of 2026.

PROGRAM DESCRIPTION AND STRENGTHS

Science and Technology Studies has been offered as an undergraduate major since the early 1970s at York, through both the BA and BSc and in various Faculties as those structures have evolved.

The Self-Study report describes the York STS program is Canada's largest and, arguably, closest program to the true interdisciplinary nature of STS. However, that Self Study Report had already alerted the reviewers to the existence of a profound rift between Science & Technology Studies (STS) faculty members and the reviewers indicate that, "rather than a single program, we were confronted with three different programs that, beyond obvious differences such as undergraduate vs. graduate level.....the content, structure, and, ultimately, fate of the STS undergraduate and graduate programs are intimately linked to a reconfiguration of the present structural arrangements"

RECOMMENDATION

Acknowledging that they were confronted by the deep divisions between faculty and Faculty structures that further complicated the situation, the reviewers provided thoughtful comments on the possibilities for the future of Science and Technology Studies in the Faculty of Science, particularly given its ties to the strong Natural Science courses.

Their report elaborated concerns about the positive feedback of students pursuing individual courses in STS and the challenges that STS students pursuing the major majors expressed in terms of making sense of the program and its goals.

The reviewers recommended building on the strengths of the program and "revamping the STS major along more cogent and focused lines, with some descriptor that is legible to incoming undergraduates and potential employers."

INSTITUTIONAL RESPONSE TO RECOMMENDATION

The Vice-Provost Academic, in consultation with the chair Joint Sub-Committee on Quality Assurance, determined that it would not be appropriate or fruitful to request program and decanal responses to the reviewer recommendations. The decision was made to defer the preparation of the Final Assessment Report until the review and restructuring of the undergraduate program could be finalized

Important consultations and discussions about the undergraduate program were undertaken between 2017 and 2021 with support provided by the Vice-Provost Academic and the Office of Institutional Planning and Analysis. The undergraduate program continues to be housed in the Faculty of Science.

2022 Program Enhancements to the Undergraduate Program

Curriculum and program renewal discussions for Science and Technology Studies have been supported by the Office of the Vice-Provost Academic, the Dean's Office in the

Faculty of Science, research offered by the Office of Institutional Planning and Analysis, and thoughtful discussions by faculty dedicated to the program. The major has undergone significant restructuring, redesign and curriculum renewal. This led to a major modification that has resulted in a renewed program including updated program learning outcomes. The program has also been renamed Science, Technology and Society to more appropriately reflect the objectives of the program. A proposal is under development to also rename the department. In addition, a minor option has been established, with specific disciplinary themes identified, Life Sciences and Society, Technology Innovation and Society, and Earth, Sustainability and Society. The minor option is open to students from all Faculties.

At the January 2022 meeting of the York University Senate, the above modifications were approved for implementation in Fall of 2022.

The Implementation Plan below summarizes the actions resulting from the Cyclical Program Review process.

Action	Responsible Individuals	Timelines
Review of undergraduate program	Members of the undergraduate program; OIPA, Office of the Vice-Provost Academic	Academic Year 2017-2021
Major Modifications proposal finalized	Dean, Faculty of Science, members of the undergraduate program	Academic Year 2020-2021; proposal for changes effective Fall 2022 approved by Senate

YORK UNIVERSITY

Final Assessment Report – Executive Summary

SCIENCE AND TECHNOLOGY STUDIES

Faculty of Graduate Studies

**Science and Technology Studies
Graduate Programs (MA and PhD)**

Cyclical Program Review – 2009 to 2016

This Final Assessment Report (FAR) provides a synthesis of the cyclical review of the programs listed below.

Program(s) Reviewed:

MA, PhD

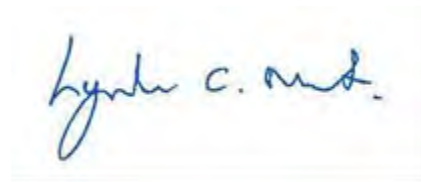
Reviewers appointed by the Vice-Provost Academic:

Dr. Alberto Cambrosio, Department of Social Studies of Medicine, McGill University
Dr. Hannah Landecker, Department of Sociology & Centre for Genetics and Society, University of California (UCLA)
Dr. Spiros Pagiatakis, Associate Dean, Research & Graduate Studies, Lassonde School of Engineering, York University

Cyclical Program Review Key Milestones:

Cyclical Program Review launch: September 15, 2016
Self-study submitted to Vice-Provost Academic: August 9, 2017
Date of the Site Visit: October 24-25, 2017
Review Report received: November 16, 2017

Final Assessment Report and Implementation Plan received by the Joint Subcommittee on Quality Assurance, March 2022

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Lyndon Martin, Vice-Provost Academic, York University

This review was conducted under the York University Quality Assurance Protocol, August 2013.

SITE VISIT: October 24-25, 2017

The reviewers met with Alice Pitt, Vice-Provost Academic and Fahim Quadir, Interim Dean, Faculty of Graduate Studies. In addition the reviewers met with all of the Deans involved with the STS program, Ray Jayawardhana, Dean, Faculty of Science, Alex Mills, Associate Dean Students, Faculty of Science, Ananya Mukherjee-Reed, Dean, Liberal Arts and Professional Studies, Sylvie Moran, Associate Dean of Research, Faculty of Science, Buks Van Rensberg, Associate Dean of Faculty, Faculty of Science.

Interviews were held with faculty members involved in the STS program: Kenton Kroker, STS Chair, STS Faculty (group interview, 5 members), Ernst Hamm, former STS Chair, other STS scholars at York (group interview: 5 members), Kean Birch, STS Graduate Program Director, John Dupuis and Genny Jon, Librarians, STS Graduate Program Faculty Members (group interview: approx. 10-15 faculty members, coming and going).

A few faculty members who could not be present because of other academic commitments emailed submissions to the reviewers.

Student participation in the site visit was robust. The reviewers met with the following graduate and undergraduate students: the STS Graduate Students (group interview: approx. 35-40 students) and the STS UG Majors/Minors students (group interview: 5 students). The reviewers noted that the most impressive meeting, both in terms of attendance and of issues raised, was with graduate students, who provided an open letter signed by 40 out of 47 graduate students, and a large number of individual letters that provided additional detail.

OUTCOME

The Vice-Provost Academic, upon receipt of the External Review Report, determined that regular process of a cyclical program review could not proceed, and the programs would not be asked to respond to recommendations. The Provost's Office assumed responsibility for working with deans, faculty, and students to organize a facilitated process for discussing the programs' challenges, exploring solutions and developing a path forward.

A report on the progress of the initiatives outlined in the implementation plan will be included in the Self-Study undertaken as part of the next Cyclical Review which will launch in September 2022 in alignment with the other programs in the Humanities Department, Faculty of Liberal Arts and Professional Studies. A site visit will take place in Fall of 2023 or Winter of 2024.

PROGRAM DESCRIPTION AND STRENGTHS:

The reviewers stated in their report that, "STS is a rapidly growing field, as shown, for instance, by the very successful meetings of its professional associations, e.g., the Society for Social Studies of Science (4S) meeting in Boston (September 2017) with

approx. 1400 participants, and the joint 4S/EASST (European Association of Science & Technology Studies) meeting in Barcelona (September 2016), that drew over 2000 participants presenting over 1700 papers in 32 parallel sessions. York University has a number of distinguished faculty members who are internationally recognized as leading STS scholars.”

The Self-Study report describes the York STS program is Canada’s largest and, arguably, closest program to the true interdisciplinary nature of STS. However, that Self Study Report had already alerted the reviewers to the existence of a profound rift between Science & Technology Studies (STS) faculty members and the reviewers indicate that, “rather than a single program, we were confronted with three different programs that, beyond obvious differences such as undergraduate vs. graduate level.....the content, structure, and, ultimately, fate of the STS undergraduate and graduate programs are intimately linked to a reconfiguration of the present structural arrangements”

Challenging discussions about resources and administrative structures of the program took place between 2017 and 2021, culminating with a shift for the Graduate program which is now resourced through the Faculty of Liberal Arts and Professional Studies. The undergraduate program is offered through the Faculty of Science.

RECOMMENDATION

Acknowledging that they were confronted by the deep divisions between faculty and faculty structures that further complicated the situation, the reviewers were able to provide some thoughtful commentary on possible reconfiguration and realignment of the graduate programs from the Faculty of Science to the Faculty of Liberal Arts and Professional Studies.

Their report elaborated concerns about the existing graduate programs and recommended suspension of admission to these programs pending resolution of the location of the program, how faculty are appointed to the program, and a revised governance structure for the program.

The reviewers said, “Therefore, we see the way forward along the following path. We recommend that a discussion and decision-making process be laid out that is directed toward the goal of building on the program’s manifest promise and strength in a manner that is bureaucratically and economically feasible, so that the focus can return to the intellectual project, nurturing the careers of York’s outstanding STS scholars and students. We recommend that all of the interested faculty and all of the implicated Deans and Associate Deans come together to work through the possible scenarios.”

INSTITUTIONAL RESPONSE TO RECOMMENDATION

The Vice-Provost Academic, in consultation with the chair Joint Sub-Committee on Quality Assurance, determined that it would not be appropriate or fruitful to request program and decanal responses to the reviewer recommendations. The decision was made to defer the preparation of the Final Assessment Report until the restructuring

discussions could be finalized and the resulting faculty alignment with the program allowed for programs to contemplate the reviewers' comments about program redevelopment options.

Despite delays created by the pandemic over 2020/2021, progress has been made. The graduate programs are now housed in the Faculty of Liberal Arts and Professional Studies.

A summary of activity since the Review Report was received in October 2017 is below and is included as a preface to the major modification that was approved by York University's Senate in May of 2021.

Since the CPR Report (Oct 2017), the STS graduate program has consulted with a wide range of stakeholders at York, including:

- *Several meetings with the Provost and Vice-Provost Offices to discuss the CPR and subsequent changes needed to the Program (e.g., Dec 2017, Feb 2018, Mar 2018, Jun 2018, Mar 2020);*
- *Several meetings with Deans (e.g., LA&PS) and Department Chairs (e.g., Social Science, Humanities) to discuss changes and moving the Program (e.g. 2018, Mar 2020, Apr 2020);*
- *Regular meetings with the Dean of FGS to discuss future changes; -Working group of Program members drawn from units across 8 of York's Faculties (Nov 2018-Mar 2019);*
- *Program Annual General Meetings (e.g., Mar 2019, Oct 2019) to discuss the working group's proposed changes;*
- *Creation of 4 ad hoc sub-committees of the Program Executive to coordinate restructuring of program requirements and governance implications, drawing on Program members from units across 7 of York's Faculties (Dec 2019-Mar 2020);*
- *Program Symposium on "STS Futures" (Feb 2020) bringing together some of the world's leading STS scholars with Program faculty and students to discuss general issues about the future of STS as a field. Most of these meetings, working groups, committees, etc. have included the involvement of both faculty members and graduate students in their discussions, deliberations, and decision-making.*

2021 Program Enhancements to the Graduate Program

At its April 2021 meeting, the York University Senate approved major modifications, proposed in response to the Review Report from 2017, that included new program requirements (new research cluster course; new colloquium requirement and a new Competencies Exam), as well as some small enhancements to existing program requirements. The major modifications proposal also confirmed the relocation of the graduate program in Science and Technology Studies from the Faculty of Science to the Humanities Department in the Faculty of Liberal Arts and Professional Studies.

The Implementation Plan below summarizes the actions resulting from the Cyclical Program Review process.

Action	Responsible Individuals	Timelines
Establish revised governance for the graduate program.	Members of the graduate program	Academic Year 2017-2020
Resource Faculty for the graduate program determined.	Deans, LAPS and Science, members of the graduate program	Academic Year 2020-2021
Program requirements reviewed and revised.	Members of the Graduate Program	Academic Year 2020-2021

YORK UNIVERSITY

Final Assessment Report

TESOL Undergraduate Certificate

(Teaching English to Speakers of Other Languages)

Department of Languages, Literatures and
Linguistics

Faculty of Liberal Arts and Professional Studies

Cyclical Program Review – 2012 to 2019

This Final Assessment Report (FAR) provides a synthesis of the cyclical review of the programs listed below.

Program(s) Reviewed:

TESOL Undergraduate Certificate

Reviewers appointed by the Vice-Provost Academic:

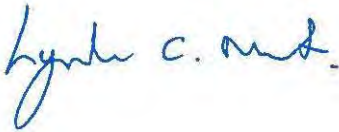
David Wood, Professor, Carleton University School of Linguistics and Language Studies
Jacob Beck, Associate Professor, York University Department of Philosophy

Cyclical Program Review Key Milestones:

Cyclical Program Review launch: September 19, 2019
Self-study submitted to Vice-Provost Academic: July 16, 2021
Date of the Site Visit: October 15, 2021
Review Report received: November 15, 2021
Program Response received: February 1, 2022
Dean's Response received: March 17, 2022

Final Assessment Report and Implementation Plan received by the Joint Subcommittee on Quality Assurance, March 2022.

Follow-up Report due October 2023.



Lyndon Martin, Vice-Provost Academic, York University.

This review was conducted under the York University Quality Assurance Protocol, August 2013.

SITE VISIT: October 15, 2021

The reviewers met with the Vice-Provost Academic, Lyndon Martin, Chair of the Department of Literatures and Linguistics, Maria Joao Dodman, TESOL Coordinator, Antonella Valeo, and the Administrative Coordinator of the Department, Josie Sansonetti. Meetings for discussion and interviewing were held with faculty members and students from the TESOL program. No facilities were visited as the visit was conducted virtually by Zoom.

OUTCOME:

The Joint Sub-Committee on Quality Assurance received the Program and Decanal responses to the recommendations and has approved an implementation plan. A report on the progress of the initiatives undertaken in response to recommendations in general and as specified in the implementation plan will be provided in the Follow-up Report which will be due 18 months after the review of this report by the York University Joint Sub-Committee on Quality Assurance, in October 2023.

The next Cyclical Program Review will begin in the Fall of 2027 with a site visit expected in the Fall of 2028 or Winter of 2029.

PROGRAM DESCRIPTION AND STRENGTHS:

The reviewers noted the following about the program, “The general objectives of the program are very clear and represent a good example of a program of this type. The list of objectives specifies fundamental areas such as language acquisition theory, language teaching methodology, and experiential knowledge, and timely and important content areas such as assessment, learner-centredness, and technology-mediated instruction. It is clear that the faculty have spent significant time and effort in ensuring that objectives are well crafted.”

The Review Report makes specific note of the program’s accreditation by TESL Ontario, the organization that has responsibility for accrediting TESL teacher education programs in the province. Graduates of accredited programs receive professional certification as teachers of ESL to adults in government-funded programs for newcomers to Canada. The York program annually reports to TESL and clearly meets the required standards.

The reviewers stated in their report, “The program is a good example of the current state of the field of TESL. A particular innovation which is very relevant to the current state of the field is the focus on technology mediated learning.” They also noted that this area might benefit from a whole course focussing on this area, and another on assessment and testing and pedagogical grammar, both important areas of focus in the field.

The Review Report discussed concerns about the practicum component of the TESOL program and provided some suggestions, while noting that the program has created valuable connections within York and also with the community. The reviewers recognised the links with Meiji University in Tokyo as an example of an innovative

delivery method for practicum options. They noted the resource stress of supporting practicum.

“The faculty who are involved in the TESOL program are its greatest asset”, states the Review Report, noting their strong reputations in a range of areas central to the teaching of English as a Second Language.

RECOMMENDATIONS AND RESPONSES:

Recommendation 1

The current optional/elective courses in linguistics should be reconsidered. Eliminating or reducing them and adding courses more relevant to TESOL would strengthen the program and make it more attractive to potential students.

Program’s Response

The program was initiated jointly by faculty in the ESL section and the Linguistics program and included both existing undergraduate linguistics courses and new courses specific to TESOL. Linguistics majors can count linguistics courses towards both their undergraduate linguistics degrees and the TESOL Certificate. As such, program enrollment has included a significant number of undergraduate linguistics majors. The program also increasingly attracts undergraduate students from across programs and faculties at York as well as adults with completed degrees who are admitted through direct entry. Since its inception, the professional and academic landscape relevant to TESOL has undergone extensive change that includes development of accreditation, changes in community engagement, and emerging workplace conditions and learner needs.

In response, the program will propose changes to the program that include removing linguistics courses as required courses and proposing new TESOL specific courses that will address the gaps in the program. This will be carried out in collaboration with the Linguistics program to ensure that the TESOL program remains an attractive option to undergraduate linguistics majors. The program will also initiate collaborative discussion with the graduate program in Linguistics and Applied Linguistics; this program includes courses in the applied linguistics stream that may provide an opportunity to cross-list existing courses on English for academic purposes and technology-mediated language teaching.

Dean’s Response

The Office of the Dean of LA&PS appreciates the program’s response and supports the revision of the program to create new courses to replace the current Linguistics courses. It is agreed that this will refresh the curriculum and potentially create attractive new courses that might be more relevant to the learning outcomes of the certificate program. These courses could also be attractive to new students.

The TESOL coordinator should consult with Linguistics on this change and seek to cross-list any new courses (if appropriate) with Linguistics to ensure that LIN students can continue to take such courses as credit toward their major. This will also help with enrolments and sustainability. A program modification proposal should be developed.

Recommendation 2

The practicum component of the program should be managed by one individual among the faculty, with a course release. Effort should be made to increase the number of available placements and alternatives to the current practicum structure should be considered – e.g., making it a requirement but not a course, encouraging students who do not need TESL Ontario accreditation to explore alternative (and possibly shorter) experiences.

Program Response

The practicum component provides the experiential education that is an essential component of accreditation and critical to the success of TESOL graduates. It is currently delivered as an individual course with the course director responsible for both administration of the experiential education placements as well as the instructional component of the course. The program is coordinated by another faculty member appointed as Coordinator under Appendix P of the Collective Agreement and receives a stipend for this role. The program will be proposing that the program coordinator position be assigned a .5 course release and assume the administration of the placements. This will allow the program to develop broader institutional-based partnerships for potential placements and will release the course director to focus on the instructional component of the practicum course.

In addition, the program will propose the creation of streams within the program that will respond to the needs of students who wish to teach internationally or in contexts that do not require accreditation by TESL Ontario. These streams will include all the essential academic and professional content that is essential for graduate success but allow for a streamlined version of the program to be completed. The program will also explore the applicability of a micro-credential model.

Dean's Response

Administrative support is defined by the collective agreement with the York University Faculty Association and determined by the size of the program. Currently, the coordinator role for TESOL is eligible for a stipend rather than course release. Shifting responsibilities for the administration of placements from the course director to the program coordinator does not affect the allocation of administrative support defined by the collective agreement.

The Experiential Education staff in the Office of the Dean of LA&PS will continue to work with the TESOL program coordinator and the course director for the placement course on the administration of placements and employer relations.

Recommendation 3

The program can be marketed more widely with the addition of new courses and with an expanded focus on international teaching. This could be augmented by an emphasis on the research credentials of the faculty members.

Program Response

The TESOL program at York is notable for the fact that all the instructors are professionally accredited tenured/tenure-stream academic faculty with pedagogical and research expertise in TESOL. The program will examine how to highlight and promote faculty profiles within the constraints of York's current website model that limits this feature of program information available online.

The program will build on the success of the international partnership with Meiji University in Tokyo to expand opportunities for students to gain experience teaching in international contexts in other parts of the globe. Most recently, we have explored a partnership with a university in Mexico. Financial support from York International and LA&PS has and will continue to be critical to this expansion and development.

Dean's Response

The Dean's Office continues to support ongoing internationalization efforts in the TESOL program including international partnerships with universities around the world.

IMPLEMENTATION PLAN

The chart below lays out the implementation plan approved by the Joint Sub-Committee at its meeting in March 2022

	Recommendation	Action	Responsible for Follow-up	Timeline
1.	That a review of optional courses be undertaken and specific TESOL courses be developed.	Program coordinator, in collaboration with colleagues, develop a proposal to remove existing linguistics courses and develop new TESL courses.	TESOL coordinator; Offices of the Associate Dean, Programs and Associate Dean, Teaching & Learning	Program proposal approved by Winter 2023 term.
2.	That the practicum component of the program be managed by one individual and an effort be made to increase placements options.	TESOL coordinator meet with the LA&PS Experiential Education Coordinator to review program needs and placement support.	TESOL coordinator; LAPS Experiential Education Coordinator	Discussions begin no later than May 2022.
3.	That the program be marketed more widely an expanded focus on international teaching and an emphasis on the research credentials of the faculty members.	Ongoing support available to program through Associate Dean, Global & Community Engagement.	TESOL coordinator; Associate Dean, Global & Community Engagement	Ongoing

2020-2021 Annual Report on Non-Degree Studies

Prepared by Lyndon Martin, Vice-Provost Academic, April 2022

Introduction

The University maintains a strong interest in the development and implementation of non-degree/non-credit activities. These activities have the potential to enhance York's reputation as a comprehensive and innovative University, they promote lifelong learning, and they support access to post-secondary education, thus contributing to the priorities of the 2020-2025 University Academic Plan. They also diversify revenue streams for the University and provide an opportunity for Faculties to explore new and emerging areas of study.

The Non-Degree Studies Advisory Committee is made up of Deans or their delegates, often the Director of the Faculty's continuing education unit. It meets at least once annually to discuss their programs, trends, and opportunities for collaborations. A report of non-degree activities at the University is provided annually to ASCP and APPRC and to Senate based on unit submissions that document program offerings and enrolments and describe the nature of programs and their landscape.

This report reflects activities for the May 2020 to April 2021 period. Previous reports included information from September 1 to August 30 so direct comparisons may not be valid. The change is to align with other enrolment reporting at the university.

For the annual report, each non-degree studies unit was asked to provide a summary of enrolment activity and to comment on challenges and opportunities. Common among the challenges is the increased number of opportunities for life-long learners being offered at other post-secondary institutions, including institutions from outside of Ontario that are taking advantage of the large population base of the GTA. This, combined with cutbacks from government organizations for professional development, has the potential to curtail enrolments at York. Opportunities identified by units include close ties with industry partners and the possibility of re-definition of credentials as micro certifications and the digitization of these, for example, digital badges. The advent of COVID-19 restrictions in March 2020 and the continuation through the following year had an impact on offerings as units pivoted to greater remote/on-line offerings.

There is a wide range of practices for offerings and the naming of programs across the units offering these courses and programs, and even within a unit. All programs are subject to the Revised Principles and Procedures Governing Non-Degree Activities at York University that were approved by York University's Senate in June 2019. Approval processes for most Faculties have now been authorized by Faculty Councils and the relevant documentation has been received in the Office of the Vice-Provost Academic.

Summaries of the reports from the School of Continuing Studies and units offering

non-degree/non-credit studies in Education, Glendon, Health, Liberal Arts and Professional Studies, Osgoode, Schulich and the Office of the Vice-President Research and Innovation for Organized Research Units are below.

In addition, the Faculties of Arts, Media, Design and Performance (AMPD) and Environmental and Urban Change (EUC) are considering offering non-degree/non-credit options. The Lassonde School of Engineering is exploring potential non-degree offerings through Lassonde Professional Development (LPD) which also ran a number of free workshops through its Disruptive Innovation Hub (DIH) and expects to build on this in the coming years. The Faculty of Science is exploring the development of non-degree/non-credit offerings that go beyond the existing not for credit courses designed to support transition to university orientation and bridging courses.

In 2020-2021 over 27,000 students participated in non-degree/non-credit courses or programs at York University. Overall, Osgoode's Professional Development groups served the highest number of students, followed by Education, the Schulich Executive Centre (SEEC) and the School of Continuing Studies.

In December 2021, the Ministry of Colleges and Universities approved over 200 of York's non-degree/non-credit offerings as micro-credentials that would be eligible for OSAP, an important step for supporting students seeking to refine their skills through short duration courses.

School of Continuing Studies

The York University School of Continuing Studies is a diverse community of learning united by a shared sense of purpose — achieving personal and professional growth in a world of constant change. Students are set up for success through the teaching of specialized knowledge and technical skills, as well as enhancement of soft skills, cultural understanding, and cross-disciplinary know-how. The School's ability to help students lead in the face of this change has made it the fastest-growing school in Canada. In 2021, the School of Continuing Studies completed its 6th fiscal year. Construction continues on the School's new building with completion expected for April 2022. The School has two areas of focus: Professional Programs and the English Language Institute.

Professional Programs

The School offers part-time programs that serve working professionals and full-time programs to serve recent graduates recruited both domestically and internationally. Programs may be aligned with professional certification (where applicable) and are normally available as in-class, blended, or online.

Programs are co-designed and delivered by senior industry leaders within established, high-demand, and emerging professional disciplines.

Since the School's launch in January 2015, thirty-one new certificate programs have been introduced in response to Canada's largest skills and employment gaps. York has also been

the first in Canada to launch programs in emerging technology fields such as Product Management, DevOps, and People Analytics.

In spring 2020, all programs were moved online. Enrolment in part-time programs increased in summer, in response to an intensive marketing and social media campaign, as well as the launch of the Continuing Studies Emergency Benefit. The School earned its first donation to support 17 additional students through the Continuing Studies Emergency Benefit. International enrolments in full-time programs plummeted during this period.

The School offers accelerated certificate programs in fields such as:

- Data, Information & Technology (blockchain, people analytics, cyber security, DevOps, data science, machine learning, cloud computing strategy, IT audit, cyber security operations*)
- Business (accounting, human resources, business administration, risk management, information privacy, product management*)
- Marketing, Communication & Design (digital & content marketing, UX design, full-stack web development, public relations, learner experience design*)
- Mediation (family mediation, dispute resolution)
- Health (clinical research*)

* New in market since last report

In 2020, the School expanded its partnership with Innovation York to offer students in all its professional programs an opportunity to pursue entrepreneurial projects as an extra-curricular opportunity.

In 2020, the School also earned an RBC Future Launch grant to introduce the Ten Thousand Coffees virtual networking platform to its students. Since then, more than 1,000 students have expanded their professional networks over nearly 500 virtual coffees and attended 7 virtual networking events. When surveyed, the School's students cite networking as their most valued career service.

In 2021, the School piloted an intensive 11 week offering of its' Certificates in Cyber Security and Advanced Cyber Security which was approved for student funding under the OSAP Micro-credentials Program.

The School's professional programming earned a major national award this year: a CAUCE Program Award for the Certificate in UX Design. The School also earned three UPCEA Crisis Management Awards for its Continuing Studies Emergency Benefit, Virtual Groundbreaking, and #LetsContinYU campaign and two CAUCE marketing awards.

In 2020-2021, 3961 students participated from 81 different countries. Course enrolments totaled 15,010.

York University English Language Institute

The York University English Language Institute is one of the largest language institutes in North America. Students come from around the world to pursue English-language proficiency in the context of their academic and professional goals, taking advantage of flexible pathways, specialized streams, and accelerated timelines designed to support what comes next.

YUELI offers programs that are pathways to academic degrees. Among these programs are the Academic Program, Destination York Program, Pre-Destination York Program, YUBridge Program, Graduate Studies Preparation Program, and the Intensive Advanced Legal English Program, and MBA/Specialized Master's program. The Institute works closely with Faculties and academic programs to ensure the adequate preparation of applicants for their desired programs. There are also Summer and Winter Immersion Language Programs and custom-designed contract training programs offered primarily for institutional clients.

In spring of 2020, the Institute moved fully online. Enrolments in pathway programs dropped by an average of 50%, while other programs lost all enrolment. The English language sector globally was similarly affected as were other public sector institutions in Canada. Private language schools were more drastically affected, and some shut down completely.

The Institute has built considerable experience in the development and implementation of custom-designed contract training and short-term immersion programs. This year, these programs were all deferred due to the pandemic.

YUELI plays a major role in the recruitment of international undergraduate students. In fiscal 2020-2021, 36% of York University incoming undergraduate international students were recruited by and completed their pre-university training at the Institute.

In 2020-2021 more than 1,000 students participated from 30 different countries. Course enrolments totaled 2,000.

Education

The Office of Professional Learning offers innovative, responsive, and sustainable professional learning options for local and international K – 12 educators. All online, in-class, and blended courses provide rich and engaging content and learning environments that support all types of learners.

The Office of Professional Learning is one of the leading providers of Additional Qualification (AQ) courses in Ontario. These courses are intended to enhance the professional knowledge, skills, and practice of K–12 educators and are regulated by the Ontario College of Teachers (OCT). Registrants include both OCT certified teachers and internationally trained educators seeking certification in Ontario.

Professional Learning is accredited to offer 92 different AQ courses. Courses embrace an inquiry approach to learning and intentionally use collaboration, reflection, and feedback as

core instructional approaches. All AQs are facilitated by an Instructional Leader and are designed to provide content expertise and model effective classroom practices, including virtual teaching strategies and the use of online learning tools.

As mandated by the OCT, all Instructional Leaders are OCT certified educators and hold qualifications in the areas they instruct.

Through partnerships agreements, the Professional Learning Office also develops and delivers multiple non-accredited courses to provide focused and targeted professional learning opportunities to meet emerging trends and specific educational needs. We worked with education and community partners to design and develop these individualized professional learning opportunities.

In 2020-2021, Professional Learning pivoted effectively to offer all 436 AQ courses and 21 non-accredited courses virtually. 5300 registered for AQ courses, and 231 people participated in one or more of our shorter, non-accredited courses. 5% of AQ offerings were customized courses through contracts with school districts throughout Ontario and other education partners.

Glendon College

Glendon Continuing Education students are pursuing language training and/or professional development programs in both of Canada's official languages.

The 2020-2021 cohorts included non-credit private language training for adults; corporate language training for Toronto French School employees, Judges' French Language Training for federal court justices in Toronto, Bridge Training for Internationally Education Francophone Professionals in Toronto and the GTA, and training for those with a background in health disciplines that required working with older adults in a medical or long-term care setting.

Students were supported through a program in French language high schools in Ontario, a collaboration with Canadian Parents for French for all levels of French as a Second Language, virtual programming for the Toronto District School Board.

Due to the pandemic the federal government Explore Programs were cancelled in 2020.

In 2020-2021 over 700 individuals participated in Glendon's programs.

Faculty of Health

Health Leadership & Learning Network (HLLN)

The Health Leadership and Learning Network (HLLN) in the Faculty of Health serves the health industry and community locally, nationally, and internationally (professionals, management, leadership, front line staff, among others) as well as York alumni and other community members pursuing Lifelong Learning and advancing their skills within health areas.

HLLN's non-degree activities contribute to advancing the health industry approach to improving the health system, clinical care and its management, and our overall health as individuals and a society, providing leading edge skills, new knowledge for clinical practice, management, staff, and leadership. HLLN's programs focus on professional skills and competencies to be competitive and successful in new careers, career advancement and career change, health organizational development, clinical leadership, and change, and provides continuing education required for maintaining, advancing, and achieving professional licensing.

To adapt to trends for new emerging workers (especially in light of the pandemic) with flexible and career-focused education needs, HLLN continues to offer and develop courses that focus on competitive skills needed, job requirements, careers now and for the future and has adapted 100% of HLLN programs to an online format. When possible, HLLN will continue to offer in-person options.

Several small programs have been launched, working with Indigenous and First Nations Instructors to support Indigenous and First Nations health care; there are plans to expand in this area, as well as to more rural and remote locations to reach learners where they live.

HLLN is currently undergoing a transition to a digital system for operations and program delivery, using a shared services model. The goal is to create efficiency for HLLN, increase access to HLLN education for learners, increase brand loyalty, and offer a higher quality learning experience.

Micro-credentials with digital badges remain an important new emerging education "product" as the competitive education marketplace grows globally. HLLN continues to build the use of micro-credentials and corresponding clickable graphic known as the Digital Badge, into programs based on marketplace demand. HLLN currently offers micro-credentials as standalone and stacked.

In 2020-2021 just over 1,000 students were enrolled. 80% of students were in open enrolment options, and 20% through programs that were contracted to HLLN.

York University Psychology Clinic

YUPC began offering workshops to community-based professionals based on Dr. Les Greenberg's interest (a retired faculty member who was instrumental in the development and training of Emotion Focused Therapy – EFT) and the need for another revenue stream within clinic operations to meet its mandate to be revenue neutral.

Registrants are professionals from the broader GTA and internationally who provide therapy and are interested in learning and developing their skills working within in an EFT modality. Registration is through open enrolment.

The content of the material delivered is developed and is the property of the trainers that the clinic hires.

A recent change in the field is that a growing number of professional governing bodies such as College of Psychologists, College of Psychotherapist – require a certain number of continuing education credits. To-date the clinic has applied for the ability to provide Continuing Education Credits – due to the financial and human resource cost of preparing application material. Registrants have instead been provided a certificate of completion with hours of instruction and signed by the registered clinician who provides the training. Having the ability to provide CEU's will help the program be attractive to clinicians in the United States whose governing bodies have strict rules about maintaining registration status.

In 2020-2021, 200 individuals took courses offered by YUPC.

Liberal Arts and Professional Studies

The Faculty of Liberal Arts and Professional Studies offers several bridging courses including a Women's Bridging Course, a bridging course for "sanctuary scholars" – undocumented students. Between September 2020 and April 2021, 9 sanctuary scholars completed the bridging course and 5 are continuing with undergraduate studies at York. Although impacted by the pandemic, it is expected that the bridging courses and the preparatory courses for students starting university will be resumed in Summer 2021 and ongoing.

Osgoode Hall Law School

Osgoode Professional Development (OPD) creates and delivers programs for legal professionals (lawyers, para-legals and judges); other professionals and executives who have legal risks or responsibilities in their jobs; and internationally trained lawyers and law students. Participants include education administrators, law enforcement officers, financial services executives, procurement officers, and senior healthcare executives, to name a few of our "non-lawyer" markets. Programs range from legal updates; to licensing exam preparation; to comprehensive coverage of an area of law; to intensive skill-building programs in areas such as contract drafting, advocacy and negotiation.

Programs are delivered face-to-face; by live web-stream; and through archived captures, available in scheduled offerings or through an on-demand catalogue. A number of programs are available in a blended format. Also, self-paced e-courses have been recently introduced. Program topics are validated through market research and learning objectives and curricula are developed in concert with Advisory Boards or Program Chairs who are, for the most part, senior legal practitioners.

A growing part of offerings is in-house and customized training for organizations, primarily public sector organizations. In the period May 2020 through April 2021, approximately 7% of total non-degree revenue was from contract training.

OPD has several partners and collaborators for program design and delivery, for example, Canadian Council of Health Information Management, Supply Chain Management Association (ON), The Advocates' Society, Ministry of the Attorney General, Aboriginal Legal Services of Toronto, Human Resources Professional Association, the Society of Ontario

Adjudicators and Regulators, Forum of Canadian Ombuds, and the International Academy of Mediators.

Due to the COVID-19 pandemic requiring continued public health measures across campus and workplaces, Osgoode professional development programs were delivered online in 2020-2021. As a result, efforts were focused on increasing learning options and enhancing the quality of online learning experiences. In addition, as a service to the community, OPD continued to work with volunteer speakers and provided complimentary online webinars dealing with COVID-19–related legal topics for multiple professions.

Throughout 2020-2021 OPD leveraged their position at the centre of innovative design and delivery of professional legal education, being already equipped with the instructional design, technology platforms, and support to move programs quickly online. OPD efficiently adapted to the shifting needs of clients as the pandemic progressed.

In 2020-2021, over 10,500 students participated in Osgoode Professional Development programs and courses.

Schulich School of Business: Schulich Executive Education Centre

The Schulich Executive Education Centre (SEEC) clients/participants (“students”) are either individuals enrolling in public open programs or organizations that contract SEEC to deliver customized programs. Participants in SEEC programs span the talent pipeline from emerging/early-in-career, mid-career/in transition, and senior leaders/executives in private, public and NGO sector organizations. They are both domestic from the GTA area, Ontario, across Canada as well as international.

SEEC non-degree programs provide participants with essential management skills, micro-credentials and certifications. SEEC programs enable higher performance and productivity, employability, and the career progression/transition of managers/executives and their organizations. Professional accreditation plays a role in some topic areas (e.g., Project Management Institute-PMI).

Instruction is provided by various Schulich and York faculty, and faculty from other Business Schools internationally as well as business practitioners, consultants, thought leaders from the community at large (business, not for profit etc.).

SEEC notes in its report that there is an increased demand for micro-credentials, digital badges, and certificates. Learners are shifting to the “choice” model of program delivery (face to face, online, hybrid or both), wanting to access learning on their own terms. There is a shift from Management and Executive Education to Professional Development and Lifelong Learning, including a focus on career path progression or transition, employability, and re/up skilling. The SEEC report notes an increase in demand for EDI focused programming, such as Anti-Black racism, unconscious bias, and inclusive leadership.

SEEC has launched a certificate model and is redesigning some programs as

micro-credentials. Programs will respond to career path needs aligning with the different career stages of potential learners.

In 2020-2021 over 3,000 students participated in SEEC offerings. 34% of enrolment was through open courses and programs; 66% custom programs.

Office of the Vice-President Research and Innovation

Various Organized Research Units (ORUs) offer short non-credit courses and programs of interest to York students and researchers, as well as external learners. Ranging from undergraduate and graduate students to professionals in their field, courses and programs are primarily open enrolment. Participants may be international or from York's local communities. During this past year all of the offerings, from courses to workshops to seminars, were held virtually. The following ORUs provided information about their activities: the Centre for Vision Research, the Institute for Social Research, the Dahdaleh Institute for Global Health Research, the Global Labour Research Centre and the York Centre for Asian Research.

Almost a thousand individuals participated in the wide variety of opportunities.

The Senate of York University – Minutes

Meeting: Thursday, 28 April 2022, 3:00 pm
via Zoom

M. Roy (Chair)	S. Gajic-Bruyea	N. Lemish	S. Rosenbaum
P. Puri (Vice-Chair)	D. Gelb	R. Lenton	V. Saridakis
P. Robichaud (Secretary)	J. Goodyer	S. Liaskos	R. Savage
J. Allen	S. Grace	T. Loebel	P. Singh
A. Amirfazi	C. Graham	W. Maas	L. Sloniowski
L. Appel	J. Grant	A. Macpherson	B. Spotton Visano
G. Audette	D. Gruspier	D. Matten	C. Steele
P. Aulakh	M. Hamadeh	C. McAulay	K. Tasa
T. Baumgartner	E. Hessels	A. McKenzie	A. M. Tarc
S. Bay Cheng	R. Hornsey	J.J. McMurty	T. Theophanidis
A. Belastro	M.D. Hosale	B. Meisner	M. Thomas
D. Berbecel	A. Hovorka	M. Morrow	K. Thomson
K. Bird	B. Hu	K. Murray	P. Timmerman
M. Bloom	U. Idemudia	S. Murtha	R. Tsushima
M. Bunch	I. Jamaa	R. Nandan	I. Uwanyiligira
D. Cabianca	M. Karakul	P. Nguyen	C. van Daalen Smith
N. Canefe	S. Karimi	A. Norwood	G. Vanstone
T. Choi	A. Kimakova	R. Ophir	A. Viens
E. Clements	J. Kirchner	K. Ozowe	R. Wang
J. Conder	T. Knight	D. Palermo	S. Watson
M. Condon	P. Kohler	P. Park	N. Waweru
S. Cote-Meek	L. Korrick	V. Pavri	R. Wildes
C. Da Silva	K. Krasny	P. Phillips	M. Winfield
M. Dodman	A. Kusi	W. Pietro	S. Winton
M. Elghobashy	P. Lakin-Thomas	M. Poon	P. Wood
S. Embleton	M. Lambert-Drache	A. Premji	R. Zacharias
J. Etcheverry	G. Langlois	A. Pyée	G. Zhu
D. Fernandez	H. Larochelle	P. Rahimpoor-Marnani	D. Zwick
M. Fiola	M F. Latchford	S. Rehaag	
L. Fromowitz	J. Lazenby	A. Rizwan	

1. Chair's Remarks

The Chair, Professor Mario Roy, Glendon, greeted Senators and gave a special welcome to Professor Poonam Puri, Osgoode Hall Law School, attending her first meeting as Vice-Chair of Senate following her appointment to the position at the March meeting. He acknowledged with sorrow the recent passing of Frances Beer, Professor Emerita of English; Professor Emeritus Hugh Parry, Humanities, who played a role in establishing the University's general education curriculum; Professor Emeritus Wolfgang Ahrens, founding Chair of the Department of Languages, Literatures &

The Senate of York University – Minutes

Linguistics and a regular member of governance committees at all levels; and University Professor Sydney Eisen, an esteemed colleague, former Dean of the Faculty of Arts, Department Chair and long-serving Senator who significantly influenced the direction of the University in its early decades.

The Chair advised that the minutes of the meeting of 24 March 2024 would be amended in response to a request from a Senator to include the Senator's commentary about the Anti-Black Racism Framework addressed in the Executive Committee's information items, Item 5. In the absence of any other requests to discuss the minutes, they were deemed to be approved along with the other items on the Consent Agenda. Noting the expectation that the discussion of the Framework from the March meeting would be carried forward to the April meeting, it was requested that the Chair add it to the April agenda as an item of Other Business. It was the decision of the Chair that the approval of the motion to adjourn the March meeting put an end to all business items and, as the Framework was not brought forward as an item of business for the April agenda, the Chair's further decision was that it not be added as an item of Other Business.

2. Business Arising from the Minutes

There was no business arising from the minutes.

3. Inquiries and Communications

a. Report of the Academic Colleague to COU

Speaking to the written report, the Academic Colleague to COU, Senator Brenda Spotton Visano, reported on the February and April COU meetings which focused on community engagement, with a presentation from Victoria Barham, Dean of Science, University of Ottawa, and decolonizing academia, featuring a presentation by York's own Vice-President Equity, People and Culture Sheila Cote-Meek. Senator Spotton Visano advised that a more fulsome update on Vice-President Cote-Meek's presentation is planned for the May Senate meeting. Academic Colleagues also received updates on a number of sector developments including immediate items related to the pandemic, ongoing changes occurring despite the pandemic and longer-term shifts in the postsecondary landscape.

4. President's Items

Comments made by President Rhonda Lenton included the following:

The Senate of York University – Minutes

- an echoing of the condolences shared by the Chair and an expression of sorrow about the passing of Filomena Ticzon, a long-serving staff member at Schulich
- an update on pandemic matters, including the extension of masking protocol in all indoor spaces on campus until further notice and the plans to scale back the University’s pandemic response going forward, with the Special Advisor for COVID-19 response moving out of her role and Yvette Munro, AVP Student Success, and Thomas Loebel, Dean of Graduate Studies, to step in as co-leads should the public health landscape change
- an expression of thanks to Special Advisor for COVID-19 response Professor Parissa Safai, Health, and her team for their efforts to safeguard the York community throughout the pandemic
- the federal budget commitment to contribute \$1.5 million in 2022-2023 towards an endowment to support the ongoing activities of the Jean Augustine Chair in Education, Community and Diaspora, held by Professor Carl E. James
- the revised timing of the opening of Markham Campus as a result of pandemic-related construction delays, with Senate to receive more information about implications on programming and the project budget once a full assessment has been completed
- reflections on the preliminary report of the Ontario Auditor General about Laurentian University’s decision to seek creditor protection in 2021
- an announcement of the honorary degree recipients to be recognized at the Spring 2022 Convocation ceremonies
- an acknowledgement of Holocaust Remembrance Day and the National Day of Mourning for those who have lost their lives, suffered injury or illness on the job, or experienced a work-related tragedy

The monthly “Kudos” report on the achievements of members of the York community can be accessed with other documentation for the meeting.

Committee Reports

5. Executive Committee

- a. Facilitated Consultation: Parameters for declaring the disruption ended

In introducing the item, the Vice-Chair pointed Senators to the Committee’s written report which provided background and context for the consultation on ending the

The Senate of York University – Minutes

disruption to academic activities declared on 13 March 2020 in response to the COVID-19 pandemic. Senators' views were sought on the following question:

What are the key parameters to consider in deciding on the timing to declare the COVID-19 pandemic disruption has ended?

A wide-ranging discussion ensued in which a number of themes surfaced, including:

- the importance of distinguishing between operational and academic activities when assessing ongoing impacts of the pandemic
- the need to consider ongoing limitations to students' access to campus for academic activities outside of the classroom in assessments of whether to continue the disruption
- the efficacy of the Disruptions Policy to adapt to changing circumstances
- the diminished need to rely on the Disruptions Policy to uphold principles of academic integrity, fairness to students and timely information, given the University's ability to capably manage effects on the classroom at this stage of the pandemic
- the signal that lifting the disruption may send to the York community

Senators' input was gratefully received and, along with feedback from Faculty Councils and the University community, will inform future discussions about the appropriate timing and circumstances for lifting the disruption.

b. Information Items

The Vice-Chair expressed enthusiasm to serve in the role and reported on the following items on behalf of the Executive Committee:

- encouragement for Senators to assist in identifying prospective candidates for Senate committees and other positions elected by Senate in response to the recent call for expressions of interest, in particular the Tenure & Promotions Committee
- an update on the status of the Committee's review of the Rules of Senate, with Senate to receive Notice of Motion for the slate of revisions in May
- its receipt of an update on the activities of the Sub-Committee on Equity, including engagement with Faculty Councils and Senate committees to identify opportunities to advance equity objectives in those contexts

The Senate of York University – Minutes

- the addition of a candidate to the pool of prospective recipients of honorary degrees

6. Academic Standards, Curriculum and Pedagogy (ASCP)

- a. Establishment of a stream in Communication, Social Media & Public Relations within the Honours BA degree program in Communication and Media Studies, Markham Campus, LA&PS

It was moved and seconded **“that Senate approve the establishment of a stream in Communication, Social Media & Public Relations within the BA (Honours) program in Communication and Media Studies, housed in the Department of Communication and Media Studies, Faculty of Liberal Arts & Professional Studies, and located at Markham Campus, effective FW2023-2024.”**

In view of the information shared by Senator Lenton during the President’s Items regarding the launch of Markham Campus, Senator Martin Bunch, ASCP Chair, confirmed that the implementation timing of curriculum approved for the campus would be assessed and adjusted if needed. In the meantime, the curriculum proposals were being moved forward with 2023-2024 as the effective date.

The motion was *carried*.

- b. Establishment of new streams in the BScN degree Programs (4-Year Direct Entry, 2nd Entry, and Post-RN Internationally Educated Nurses), School of Nursing, Faculty of Health

It was moved, seconded and *carried* **“that Senate approve the establishment of streams in Nursing Practice in High Acuity and Critical Care Settings and Nursing Practice in Mental Health, Illness and Addictions Care within the 4-Year Direct Entry, 2nd Entry and Post-RN IEN BScN programs, housed in the School of Nursing, Faculty of Health, effective FW2022-2023.”**

- c. Major modifications to the degree requirements for BA (Honours) programs in Cognitive Science, Department of Philosophy, LA&PS

It was moved, seconded and *carried* **“that Senate approve major modifications to the degree requirements for the BA (Honours) programs in Cognitive Science, housed within the Department of Philosophy, Faculty of Liberal Arts & Professional Studies, effective FW2022-2023.”**

The Senate of York University – Minutes

d. Establishment of the Senate Academic Forgiveness Policy

It was moved, seconded and *carried* **“that Senate approve, effective FW2022-2023,**

- **The establishment the *Senate Academic Forgiveness Policy*, as set out in Appendix D, and**
- **The rescission of the *Policy and Guidelines on the Withdrawn from Course Option*, the *Policy on Course Relief*, and the *Policy on Repeating Passed or Failed Courses for Academic Credit*.**

e. Revisions to the Senate Policy on Sessional Dates and the Scheduling of Examinations

It was moved and seconded **“that Senate approve revisions to the *Senate Policy on Sessional Dates and the Scheduling of Examinations*, as set out in Appendix E, effective FW2022-2023.”**

A discussion about the Policy ensued, in which Senators sought clarifications about the proposed revisions. Hearing the views expressed and questions that remained, Senator Bunch *withdrew* the motion, with the concurrence of the seconder, with a view to returning the Policy back to the Committee for further discussion.

f. Information Items

ASCP reported that Professor Nicolette Richardson, Health, had been designated to serve as Chair for the remainder of the academic year in the absence of Senator Bunch.

ASCP also reported on the following minor changes it had approved effective FW2022-2023 unless otherwise indicated.

AMPD

Degree requirements for the Honours BA Minor program in Computational Arts,
Department of Computational Arts (effective FW2023-2024)

Degree requirements for the BA and Specialized Honours BA and BFA programs in
Theatre, Department of Theatre

AMPD / Lassonde

Degree requirements for the Specialized Honours BA and BA programs in Digital Media,
Department of Computational Arts / Department of Electrical Engineering and
Computer Science

The Senate of York University – Minutes

Health

Practicum requirements for the BScN in Nursing program (4-year Direct Entry, 2nd Entry, Post-RN Internationally Educated Nurses), School of Nursing
Admission requirements for the Certificate in Athletic Therapy, School of Kinesiology and Health Science

Graduate Studies

Degree requirements for the Master of Science in Management Practice, School of Administrative Studies, LA&PS
Retirement of International Business (IBUS) Specialization within the MBA program, Schulich
Admission requirements within the Operations Management & Information Systems Field within the PhD program in Administration, Schulich

Lassonde

Degree requirements for the BSc and Honours Minor BSc programs, and the Atmospheric Science stream within the Specialized Honours and Honours BSc programs in Earth and Atmospheric Science, Department of Earth and Space Science and Engineering
Establishment of CSSD rubric for the BAsC programs in Computer Science for Software Development, Department of Electrical Engineering and Computer Science
Establishment of DIGT rubric for the BAsC programs in Digital Technologies, Department of Electrical Engineering and Computer Science
Degree requirements for the Specialized Honours BEng program in Civil Engineering, Department of Civil Engineering

Schulich

Establishment of GMMM rubric for courses in the Global Mining Management area
Establishment of SUST rubric for courses in the Sustainability area

ASCP reported on the following corrections to degree requirements effective FW2022-2023 that had been transmitted to the Committee for information:

Health

BA and BSc programs in Global Health
Bachelor of Health Studies programs in Health Policy, Health Management, Health Studies, and Health Informatics
BSc programs in Psychology

The Senate of York University – Minutes

Lassonde

Complementary Studies Requirements for the BEng programs

LA&PS

Honours Minor BA program in Japanese Studies

BA programs in Religious Studies, Business and Society, and History

Bachelor of Human Resources Management programs

Science

BSc programs in Biology, Chemistry, and Physics and Astronomy

BA and BSc programs in Science and Technology Studies

Recognizing the large volume of curriculum items reviewed by ASCP over the academic year, the Chair thanked Senator Bunch and Committee members for their hard work and dedication.

7. Academic Policy, Planning and Research (APPRC)

a. Information Items

On behalf of the Committee, Senator Brenda Spotton Visano, APPRC Chair, reported on the following items:

- its reflections on the ideas and suggestions surfaced in the APPRC-sponsored spring planning forum on the *Future of Pedagogy* and initial discussion of possible next steps
- its receipt of notification of the delayed opening of Markham Campus and input provided to President Lenton on academic planning and resource allocation matters to be considered as decisions are made about program launch options
- its concurrence with the recommendation of the Provost to establish the CIBC Chair in Sustainable Finance within the Schulich School of Business, which will proceed to the Academic Resources Committee of the Board of Governors and the Board for approval
- its receipt of a report on activities of Senate Executive's Sub-Committee on Equity

8. Awards

a. Information Items

The Senate of York University – Minutes

The Awards Committee congratulated the recipients of the 2022 President’s Research Awards, who had been selected as a result of the Committee’s adjudication in Winter 2022.

President’s Research Excellence Award

Zheng Hong (George) Zhu, Department of Mechanical Engineering, Lassonde

President’s Research Impact Award

Seyed Moghadas, Department of Mathematics and Statistics, Science

President’s Emerging Research Leadership Award

John Moores, Department of Earth & Space Science & Engineering, Lassonde
(Engineering, Science, Technology, Health and Biomedicine Cluster)

Amy Muise, Department of Psychology, Faculty of Health (Social Sciences, Art & Design, Humanities, Business, Law and Education Cluster)

Drawing Senators’ attention to the 2020-2021 Graduate Award Disbursement Report included in the agenda package, Senator Shayna Rosenbaum, Awards Committee Chair, highlighted the efforts of the Faculty of Graduate Studies to increase access to graduate education for historically disadvantaged groups, with explorations of opportunities to strengthen support for high priority students underway.

9. Other Business

There being no further business it was moved, seconded and *carried* “**that Senate adjourn.**”

Consent Agenda Items

10. Minutes of the Meeting of 24 March 2022

The minutes of the meeting of 24 March 2022 were *approved by consent*.

11. 2020-2021 Annual Report on Petitions and Appeals

The Annual Report on Petitions and Appeals was *noted*, having been circulated previously to Senators as part of the March agenda.

12. Revisions to the requirements for the PhD program in Administration, Schulich School of Business

The Senate of York University – Minutes

Senate *approved by consent* changes to the coursework requirements for the Operations Management & Information Systems Field within the PhD program in Administration, Schulich School of Business, effective FW2022-2023.

13. Implementation of the New Grading Scheme: Minor amendments to various Senate policies and regulations to reflect the new grading schemes

- Visiting Students Policy
- Bridging Courses Policy and Guidelines
- Bridging Programs at York University Policy and Guidelines
- Granting Degree-Credit for Pre-University Courses
- Transfer Credit Limits for Advanced Secondary Studies

Senate *approved by consent* revisions to the above policies and regulations to reflect the new grading schemes, effective upon implementation of the new schemes, with the exception of minor editorial changes to the Visiting Students Policy which are effective immediately.

Mario Roy, Chair _____

Pascal Robichaud, Secretary _____

Senate Committee on Awards

Report to Senate

At its meeting of 26 May 2022

FOR APPROVAL

1. Amendments to the Senate Policy on *Honorific Professorships*

Recommendation:

That Senate approve revisions to the Policy section of the *Senate Policy on Honorific Professorships*, as set out in Appendix A, effective 1 July 2022.

Rationale:

Over the course of the Committee's discussions over the past several months, it was agreed that it would be beneficial to increase the number of active University Professorships (UP) and active Distinguished Research Professorships (DRP) in the Policy from twenty-five to thirty.

The rationale for this is based on the increase in the number of faculty members at the University since the award was established in 1982, and the need to bring greater diversity to the group of recipients. With this increase in the number of tenured faculty at York since its inception, the honorific professorships are granted to a diminishing fraction of faculty members, thus reducing the probability that they may aspire to the award during their academic career. Additionally, in considering an expansion of the number of recipients, the Committee took the opportunity to include in the Policy a statement on equity to bring it more in alignment with York University's Equity, Diversity and Inclusion (EDI) principles.

The proposed revisions to the Policy are presented in a side-by-side comparison in Appendix A in bolded **red** text. Also included as Appendix A is the Policy with all proposed revisions incorporated. This proposed expansion of the number of UPs and DRPs in the Policy is also confirmed by both the Provost and Vice-President Academic and the Vice-President Research and Innovation as evidenced by the letter of support provided as Appendix B.

Shayna Rosenbaum, Chair

The proposed revisions to the Policy are presented in a side-by-side comparison in Appendix A in bolded **red** text. Also included as Appendix A is the Policy with all proposed revisions incorporated. This proposed expansion of the number of UPs and DRPs in the Policy is also confirmed by both the Provost and Vice-President Academic and the Vice-President Research and Innovation as evidenced by the letter of support provided as Appendix B.

Proposed Revisions to the Senate Policy on Honorific Professorships

Current Policy	Proposed Revisions
<p>1. Purpose This policy outlines the definitions and criteria related to the University’s Honorific Professorships, the University Professorship and the Distinguished Research Professorship.</p> <p>2. Scope and Application This policy applies to the Honorific Professorships, the University Professorship and the Distinguished Research Professorship.</p> <p>3. Policy 3.1 Honours a. University Professor The University Professorship is awarded to a member of the faculty whom the University recognizes for his or her participation in University life and/or contribution to the University as a community, as well as appropriate levels of scholarship and teaching success.</p> <p>b. University Professor Emeritus/a Upon retirement, a University Professor will be named University Professor Emeritus/a.</p> <p>c. Distinguished Research Professor A Distinguished Research Professorship is awarded to a member of the faculty who has made outstanding contributions to the University through Research.</p> <p>d. Distinguished Research Professor Emeritus/a Upon retirement, a Distinguished Research Professor will be named Distinguished Research Professor Emeritus/a.</p>	<p>1. Purpose This policy outlines the definitions and criteria related to the University’s Honorific Professorships, the University Professorship and the Distinguished Research Professorship.</p> <p>2. Scope and Application This policy applies to the Honorific Professorships, the University Professorship and the Distinguished Research Professorship.</p> <p>3. Policy 3.1 Honours a. University Professor The University Professorship is awarded to a member of the faculty whom the University recognizes for his or her participation in University life and/or contribution to the University as a community, as well as appropriate levels of scholarship and teaching success.</p> <p>b. University Professor Emeritus/a Upon retirement, a University Professor will be named University Professor Emeritus/a.</p> <p>c. Distinguished Research Professor A Distinguished Research Professorship is awarded to a member of the faculty who has made outstanding contributions to the University through Research.</p> <p>d. Distinguished Research Professor Emeritus/a Upon retirement, a Distinguished Research Professor will be named Distinguished Research Professor Emeritus/a.</p>

<p>e. Emeritus/a</p> <p>The status of Emeritus/a will be conferred on all retiring full-time faculty members and professional librarians with the expectation of continued involvement in the intellectual life of the University.</p> <p>3.2 Criteria</p> <p>a. University Professor</p> <p>A University Professor will be a long-serving tenured faculty member who has demonstrated a commitment to participation in University life and/or contribution to the University as a community, as well as appropriate levels of scholarship and teaching success. Such achievement fulfills the following requirements:</p> <ul style="list-style-type: none"> i. significant long-term contribution to the development or growth of the University or of its parts; ii. significant participation in the collegium through mentorship, service and/or governance; iii. sustained impact over time on the University’s teaching mission; iv. recognition as a scholar. <p>b. Distinguished Research Professor</p> <p>The Distinguished Research Professor will have demonstrated scholarly achievement by sustained publication or other recognized and accepted demonstrations of sustained authoritative contributions to scholarship. Such achievement fulfils the following requirements:</p> <ul style="list-style-type: none"> i. includes sustained and continuing contributions to the field or fields of scholarship involved; ii. the work is of excellent quality; iii. the work has made a major impact on the discipline or field of study involved; 	<p>e. Emeritus/a</p> <p>The status of Emeritus/a will be conferred on all retiring full-time faculty members and professional librarians with the expectation of continued involvement in the intellectual life of the University.</p> <p>3.2 Criteria</p> <p>a. University Professor</p> <p>A University Professor will be a long-serving tenured faculty member who has demonstrated a commitment to participation in University life and/or contribution to the University as a community, as well as appropriate levels of scholarship and teaching success. Such achievement fulfills the following requirements:</p> <ul style="list-style-type: none"> i. significant long-term contribution to the development or growth of the University or of its parts; ii. significant participation in the collegium through mentorship, service and/or governance; iii. sustained impact over time on the University’s teaching mission; iv. recognition as a scholar. <p>b. Distinguished Research Professor</p> <p>The Distinguished Research Professor will have demonstrated scholarly achievement by sustained publication or other recognized and accepted demonstrations of sustained authoritative contributions to scholarship. Such achievement fulfils the following requirements:</p> <ul style="list-style-type: none"> i. includes sustained and continuing contributions to the field or fields of scholarship involved; ii. the work is of excellent quality; iii. the work has made a major impact on the discipline or field of study involved;
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<p>iv. the work is recognized within and appreciated beyond the University;</p> <p>v. the nominee will have an international reputation in the field of study involved.</p> <p>c. Members of any committee under the purview of Senate which has policy or adjudicative responsibility for these honours, such as the Senate Executive Committee and the Senate Committee on Awards, are not eligible for nomination to either University Professor or Distinguished Research Professor during the academic year(s) in which they sit on those committees.</p> <p>3.3 Relationship to the Tenure Stream</p> <p>a. There is no implied relationship between honorific professorships and the ranking of the tenure stream of the University.</p> <p>3.4 Term and Number of Awards</p> <p>a. Normally, no more than two appointments shall be made in each of the University Professor and Distinguished Research Professor category in a year.</p> <p>b. At any one time there shall be no more than twenty-five active University Professors and twenty-five active Distinguished Research Professors.</p> <p>c. These honours once bestowed shall be in effect until death, voluntary resignation of the title, or termination of full-time status by retirement by the respective incumbents, at which time they will adopt the style “Emeritus/a.”</p> <p>4 Roles and Responsibilities</p> <p>The Senate Committee on Awards is responsible for selecting the recipients of the Honorific Professorships, following the assessment of nominations, and shall inform</p>	<p>iv. the work is recognized within and appreciated beyond the University;</p> <p>v. the nominee will have an international reputation in the field of study involved.</p> <p>c. Members of any committee under the purview of Senate which has policy or adjudicative responsibility for these honours, such as the Senate Executive Committee and the Senate Committee on Awards, are not eligible for nomination to either University Professor or Distinguished Research Professor during the academic year(s) in which they sit on those committees.</p> <p>3.3 Relationship to the Tenure Stream</p> <p>a. There is no implied relationship between honorific professorships and the ranking of the tenure stream of the University.</p> <p>3.4 Term and Number of Awards</p> <p>a. Normally, no more than two appointments shall be made in each of the University Professor and Distinguished Research Professor category in a year.</p> <p>b. At any one time there shall be no more than thirty active University Professors and thirty active Distinguished Research Professors.</p> <p>c. These honours once bestowed shall be in effect until death, voluntary resignation of the title, or termination of full-time status by retirement by the respective incumbents, at which time they will adopt the style “Emeritus/a.”</p> <p>4 Roles and Responsibilities</p> <p>The Senate Committee on Awards is responsible for selecting the recipients of the Honorific Professorships, following the assessment of nominations, and shall inform</p>
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the President and report to Senate for information on the award of the honours.

5 Review

This policy shall be reviewed every five years.

6 Procedures for Nomination

6.1 University Professor

- a. Nominations for the University Professors will be solicited regularly from all Faculties by the Senate Committee on Awards.
- b. ii) Nominations may be made by all tenured faculty members, who shall provide a complete nomination file, including:
 - i. the nominee’s c.v.
 - ii. a detailed letter of nomination explaining how the candidate’s achievements conform to the general criteria
 - iii. three letters of support from those in a position to comment on the nominee’s achievements and contributions.
- c. The committee shall, in confidence, provide a complete copy of the file to the Dean of the nominee’s home Faculty and shall invite the Dean to provide a confidential letter of commentary on the nomination.
- d. Nominators will be advised of the committee’s decision after the deliberations. Files of those not selected will be held for three years for reconsideration by the committee, provided the nominee remains active at the University. Nominators may choose to revise or update the nomination file in subsequent years.

6.2 Distinguished Research Professor

the President and report to Senate for information on the award of the honours.

The Senate Committee on Awards is responsible for upholding York University’s values of diversity and equity within its community and encouraging nominations of those who are under-represented in recent competitions.

5 Review

This policy shall be reviewed every five years.

6 Procedures for Nomination

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 - v. a detailed letter of nomination explaining how the candidate’s achievements conform to the general criteria
 - vi. three letters of support from those in a position to comment on the nominee’s achievements and contributions.
- e. The committee shall, in confidence, provide a complete copy of the file to the Dean of the nominee’s home Faculty and shall invite the Dean to provide a confidential letter of commentary on the nomination.
- f. Nominators will be advised of the committee’s decision after the deliberations. Files of those not selected will be held for three years for

<p>a. Nominations for the Distinguished Research Professors will be solicited regularly from all Faculties by the Senate Committee on Awards.</p> <p>b. Nominations may be made by all tenured faculty members, who shall provide a complete nomination file, including:</p> <ul style="list-style-type: none"> i. the nominee’s c.v. ii. a detailed letter of nomination explaining how the candidate’s achievements conform to the general criteria iii. three letters of support from those in a position to comment on the nominee’s achievements and contributions, two of which will be from individuals external to the University who must be at arm’s length from the nominee. The individuals providing external letters of support are asked to include in their letters a statement as to their relationship, if any, with the nominee. <p>c. The committee may make additional inquiries as it sees fit.</p> <p>d. The committee shall, in confidence, provide a complete copy of the file to the Dean of the nominee’s home Faculty and shall invite the Dean to provide a confidential letter of commentary on the nomination.</p> <p>e. When the committee is considering nominations for Distinguished Research Professor, it shall invite the Vice-President Research and Innovation, and the Vice-President Academic & Provost to attend.</p> <p>f. Nominators will be advised of the committee’s decision after the deliberations. Files of those not selected will be held for three years for</p>	<p>reconsideration by the committee, provided the nominee remains active at the University. Nominators may choose to revise or update the nomination file in subsequent years.</p> <p>4.2 Distinguished Research Professor</p> <p>c. Nominations for the Distinguished Research Professors will be solicited regularly from all Faculties by the Senate Committee on Awards.</p> <p>d. Nominations may be made by all tenured faculty members, who shall provide a complete nomination file, including:</p> <ul style="list-style-type: none"> iv. the nominee’s c.v. v. a detailed letter of nomination explaining how the candidate’s achievements conform to the general criteria vi. three letters of support from those in a position to comment on the nominee’s achievements and contributions, two of which will be from individuals external to the University who must be at arm’s length from the nominee. The individuals providing external letters of support are asked to include in their letters a statement as to their relationship, if any, with the nominee. <p>g. The committee may make additional inquiries as it sees fit.</p> <p>h. The committee shall, in confidence, provide a complete copy of the file to the Dean of the nominee’s home Faculty and shall invite the Dean to provide a confidential letter of commentary on the nomination.</p> <p>i. When the committee is considering nominations for Distinguished Research Professor, it shall invite the Vice-</p>
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<p>reconsideration by the committee, provided the nominee remains active at the University. Nominators may choose to revise or update the nomination file in subsequent years.</p> <p>6.3 After assessment of nominations, the Senate Committee on Awards shall inform the President and report to Senate for information on the award of the honours.</p>	<p>President Research and Innovation, and the Vice-President Academic & Provost to attend.</p> <p>j. Nominators will be advised of the committee's decision after the deliberations. Files of those not selected will be held for three years for reconsideration by the committee, provided the nominee remains active at the University. Nominators may choose to revise or update the nomination file in subsequent years.</p> <p>6.3 After assessment of nominations, the Senate Committee on Awards shall inform the President and report to Senate for information on the award of the honours.</p>
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University Policy and Procedures

Senate Policy on Honorific Professorships

Topic:	Appointments, Tenure and Promotion, Awards and Honours
Approval Authority:	Senate
Responsible Office/Body:	
Approval Date:	22 April 1982
Effective Date:	22 April 1982; amendments effective 1 July 2022
Last Revised:	Policy: 26 May 2022; Procedures: 12 June 2019

1. Purpose

This policy outlines the definitions and criteria related to the University's Honorific Professorships, the University Professorship and the Distinguished Research Professorship.

2. Scope and Application

This policy applies to the Honorific Professorships, the University Professorship and the Distinguished Research Professorship.

3. Policy

3.1 Honours

a. University Professor

The University Professorship is awarded to a member of the faculty whom the University recognizes for his or her participation in University life and/or contribution to the University as a community, as well as appropriate levels of scholarship and teaching success.

b. University Professor Emeritus/a

Upon retirement, a University Professor will be named University Professor Emeritus/a.

c. Distinguished Research Professor

A Distinguished Research Professorship is awarded to a member of the faculty who has made outstanding contributions to the University through Research.

d. Distinguished Research Professor Emeritus/a

Upon retirement, a Distinguished Research Professor will be named Distinguished Research Professor Emeritus/a.

e. Emeritus/a

The status of Emeritus/a will be conferred on all retiring full-time faculty members and professional librarians with the expectation of continued involvement in the intellectual life of the University.

3.2 Criteria

a. University Professor

A University Professor will be a long-serving tenured faculty member who has demonstrated a commitment to participation in University life and/or contribution to the University as a community, as well as appropriate levels of scholarship and teaching success. Such achievement fulfills the following requirements:

- i. significant long-term contribution to the development or growth of the University or of its parts;
- ii. significant participation in the collegium through mentorship, service and/or governance;
- iii. sustained impact over time on the University's teaching mission;
- iv. recognition as a scholar.

b. Distinguished Research Professor

The Distinguished Research Professor will have demonstrated scholarly achievement by sustained publication or other recognized and accepted demonstrations of sustained authoritative contributions to scholarship. Such achievement fulfills the following requirements:

- i. includes sustained and continuing contributions to the field or fields of scholarship involved;
- ii. the work is of excellent quality;
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c. Members of any committee under the purview of Senate which has policy or adjudicative responsibility for these honours, such as the Senate Executive Committee and the Senate Committee on Awards, are not eligible for nomination to either University Professor or Distinguished Research Professor during the academic year(s) in which they sit on those committees.

3.3 Relationship to the Tenure Stream

a. There is no implied relationship between honorific professorships and the ranking of the tenure stream of the University.

3.4 Term and Number of Awards

- a. Normally, no more than two appointments shall be made in each of the University Professor and Distinguished Research Professor category in a year.
- b. At any one time there shall be no more than thirty active University Professors and thirty active Distinguished Research Professors.
- c. These honours once bestowed shall be in effect until death, voluntary resignation of the title, or termination of full-time status by retirement by the respective incumbents, at which time they will adopt the style “Emeritus/a.”

4. Roles and Responsibilities

The Senate Committee on Awards is responsible for selecting the recipients of the Honorific Professorships, following the assessment of nominations, and shall inform the President and report to Senate for information on the award of the honours.

The Senate Committee on Awards is responsible for upholding York University’s values of diversity and equity within its community and encouraging nominations of those who are under-represented in recent competitions.

5. Review

This policy shall be reviewed every five years.

6. Procedures for Nomination

6.1 University Professor

- a. Nominations for the University Professors will be solicited regularly from all Faculties by the Senate Committee on Awards.
- b. Nominations may be made by all tenured faculty members, who shall provide a complete nomination file, including:
 - i. the nominee’s c.v.
 - ii. a detailed letter of nomination explaining how the candidate’s achievements conform to the general criteria
 - iii. three letters of support from those in a position to comment on the nominee’s achievements and contributions.
- c. The committee shall, in confidence, provide a complete copy of the file to the Dean of the nominee’s home Faculty and shall invite the Dean to provide a confidential letter of commentary on the nomination.
- d. Nominators will be advised of the committee’s decision after the deliberations. Files of those not selected will be held for three years for reconsideration by the committee, provided the nominee remains active at the University. Nominators may choose to revise or update the nomination file in subsequent years.

6.2 Distinguished Research Professor

- a. Nominations for the Distinguished Research Professors will be solicited regularly from all Faculties by the Senate Committee on Awards.
 - b. Nominations may be made by all tenured faculty members, who shall provide a complete nomination file, including:
 - i. the nominee’s c.v.
 - ii. a detailed letter of nomination explaining how the candidate’s achievements conform to the general criteria
 - iii. three letters of support from those in a position to comment on the nominee’s achievements and contributions, two of which will be from individuals external to the University who must be at arm’s length from the nominee. The individuals providing external letters of support are asked to include in their letters a statement as to their relationship, if any, with the nominee.
 - c. The committee may make additional inquiries as it sees fit.
 - d. The committee shall, in confidence, provide a complete copy of the file to the Dean of the nominee’s home Faculty and shall invite the Dean to provide a confidential letter of commentary on the nomination.
 - e. When the committee is considering nominations for Distinguished Research Professor, it shall invite the Vice-President Research and Innovation, and the Vice-President Academic & Provost to attend.
 - f. Nominators will be advised of the committee’s decision after the deliberations. Files of those not selected will be held for three years for reconsideration by the committee, provided the nominee remains active at the University. Nominators may choose to revise or update the nomination file in subsequent years.
- 6.3 After assessment of nominations, the Senate Committee on Awards shall inform the President and report to Senate for information on the award of the honours.

Legislative history:	Approved by Senate 1982/04/22; Date Effective: 1982/04/22. Revised and Amended by Senate: 1983/02/25; 1989/05/25; 1990/11/22; 1992/03/26; 2004/11/25; 2008/09/25; 2010/01/28, 2013/06/27; 2019/06/27; 2022/05/26. Procedures revised and amended by the Awards Committee: 2017/09/28; 2018/11/22 2019/06/12.
Date of next review:	30 June 2024
Policies superseded by this policy:	

Related policies, procedures and guidelines:	
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April 22, 2022

**Office of the Provost &
Vice President Academic**

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4700 Keele St.
Toronto Ontario
Canada M3J 1P3

Tel 416 736 5280
Fax 416 736 5876

Professor Shayna Rosenbaum
216 Behavioural Science Building
Department of Psychology
Faculty of Health

Re: University Professor and Distinguished Research Professor

Dear Professor Rosenbaum:

We are pleased to inform you that we are supportive of the Senate Committee on Award's proposal to revise the Senate Policy on Honorific Professorships to expand the number of the University Professorships and the Distinguished Research Professorships, from the current twenty-five to thirty professorships each.

The annual award for each professorship is \$3,200 for active professors and \$1,000 for retired professors. The Provost's Office and Office of the Vice President Research & Innovation commits to provide the funding for these additional Honorific Professorships.

Sincerely,

A handwritten signature in black ink, appearing to read "Lisa Philipps".

Lisa Philipps
Provost & Vice-President Academic

A handwritten signature in blue ink, appearing to read "Amir Asif".

Amir Asif
Vice-President Research & Innovation