# York University Senate

## Notice of Meeting

### Thursday 25 November 2021, 3:00 – 5:00 pm

### Via Videoconference

### AGENDA

**Page**

10min

1. Chair's Remarks (M. Roy)
2. Business arising from the Minutes
3. Inquiries and Communications

20min

4. President's Items (R. Lenton)
   a. Return to campuses: Winter 2022 plans
   b. Government relations update
   c. Kudos Report ..... 1

## Committee Reports

15min

5. Executive Committee (C. Brushwood Rose) ..... 4
6. Academic Policy, Planning and Research (B. Spotton Visano) ..... 8

30min

   a. Provost's Autumn Report (Posted Separately)
      - Preliminary FW 2021-2022 enrolments update
      - Faculty complement update

20min

7. Academic Standards, Curriculum and Pedagogy (N. Richardson, Acting) ..... 13
   a. Addition of the Markham Campus location for the Common First-year Engineering programming for the BEng degree programs in Engineering, Lassonde School of Engineering (Appendix A, page 18)
   b. Addition of the Markham Campus location for the First-year Foundational Science programming for BSc degree programs, Faculty of Science (Appendix B, page 32)
   c. Establishment of a BASc degree option in Computer Science for Software Development, Markham Campus, Lassonde School of Engineering (Appendix C, page 46)
8. Other Business

## Consent Agenda

9. Minutes of the Meeting of 28 October 2021 ..... 73

*P. Robichaud, Secretary*

YORK UNIVERSITÉ UNIVERSITY

# PRESIDENT'S **KUDOS REPORT**

NOVEMBER 2021


In 2023, York University will host the Congress of the Humanities and Social Sciences, the largest academic gathering in Canada. Dr. Andrea Davis, Associate Professor in the Department of Humanities, was appointed as academic convenor for Congress 2023.

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The Schulich School of Business was ranked 10th in the world and #1 in Canada in marketing research published from 2015–2020 in the *Journal of Consumer Research*, the world's leading academic journal on consumer research. It was also ranked 4th in the world and #1 in Canada in an annual global survey conducted by *Corporate Knights*, one of the world's largest circulation magazines with an explicit focus on responsible business.

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CIFAL York launched its first event, Pre-COP26: Multi-level Joint Action for Climate, Nature and People, a knowledge-exchange dialogue on strengthening multilevel action for climate, nature and people. CIFAL centres provide innovative training throughout the world and serve as hubs for the exchange of knowledge among government officials, the private sector, academia and civil society. CIFAL York is led by professors Idil Boran and Ali Asgary.

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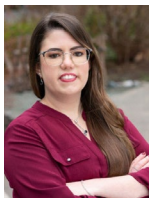

YSpace held one of its flagship events, the YSpace Technology Accelerator Demo Day, on October 6. The top three startups in the accelerator program were awarded $30,000 in prize money between them. The $15,000 first-place prize was awarded to Karolina Valente and Christine Whiteside of VoxCell BioInnovation. This biotech startup is disrupting the drug development industry and the field of oncology research by creating 3D vascularized cancer tissue models with its unique 3D bioprinter.

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Sandra Rehan, Associate Professor in the Faculty of Science, was awarded the prestigious E.W.R. Steacie Memorial Fellowship for her work in bee genomics, molecular ecology and behavioural genetics.

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Faculty of Environmental and Urban Change contract faculty member Mark Terry's documentary film, *The Changing Face of Iceland*, was screened at the United Nations Climate Change Conference (COP26) in Glasgow, Scotland, on November 4. The film examines the impacts of climate change on Iceland.

At 87 years young, Varathaledchumy Shanmuganathan became York University's oldest graduate. Shanmuganathan, who collected her master's degree in political science, is among the more than 4,000 resilient students, some young enough to be her grandchildren, who celebrated their graduation during York's virtual fall convocation.

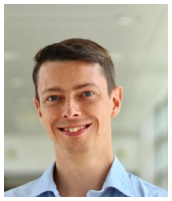
Tracey Taylor-O'Reilly, Assistant Vice-President of Continuing Studies, has been named one of this year's top 100 most powerful women in Canada by the Women's Executive Network. Launched in 2003, the Top 100 Awards celebrate the accomplishments of Canada's female executive talent.

Sheila Colla, Assistant Professor in the Faculty of Environmental and Urban Change, received the 2021 C. Gordon Hewitt Award for scientists with outstanding contributions to entomology in Canada. The award recognizes her notable achievements in the field of entomological research, conservation, education and outreach in Canada and beyond.

Andil Gosine, Professor in the Faculty of Environmental and Urban Change, received the Duke University Press Scholars of Color First Book Award for his book, *Nature's Wild: Love, Sex, and Law in the Caribbean* (October 2021). In *Nature's Wild*, Gosine engages with questions of humanism, queer theory and animality to examine and revise understandings of queer desire in the Caribbean.

Kellogg-Schulich Executive MBA student Akriti Bhatnagar was selected as the 2021 recipient of the Franklin and Sasarman Simard Scholarship, which acknowledges a student who has a strong duty of respect and service towards individuals and local communities while embracing a global cultural context; promotes equality in matters of gender, race and creed; and displays resilience and perseverance through lifelong learning.

Salar Pashtoonyar, an MFA student at York, won a bronze medal at the 48th Student Academy Awards Competition in the Narrative (International Film Schools) category for his film *Bad Omen*.



Mathieu Poirier, Assistant Professor of Social Epidemiology in the Faculty of Health, will serve as the new Associate Director at the Global Strategy Lab, where he previously worked as an Investigator and Research Director of Global Legal Epidemiology.


Frankie Billingsley, Associate Registrar and Director, Student Records and Scheduling, realized a lifelong dream when she travelled to Tokyo to be an umpire for women's softball at the Olympic Games.

Jude Kong, Assistant Professor in the Faculty of Science, was named as a Black Hero of Operational Research by the Operational Research Society.

# Executive Committee – Report to Senate

## At its meeting of 16 November 2021

## For Information

### a. Monitoring the Disruption

The Committee received a report on and discussed with the Provost the preparations for the fuller return to in-person activities in January 2022. As has been the primary focus in all planning during the pandemic disruption, the health and safety of the community remains paramount in the return to campus preparations. A specific winter safety strategy is being developed under the leadership of the *Special Advisor to the President for Academic Continuity Planning and COVID-19 Response*, Professor Parissa Safai.

The number of faculty members, staff and students complying with the University's vaccination mandate continues to increase. Efforts are continuing to follow-up with community members who have not completed the required screening. The consideration of requests for exemption or accommodation as established in the Covid-19 Vaccination Mandate also remains in progress.

The commitment to uphold health and safety principles on the campuses and to implement the specific requirements of the Vaccination mandate has meant that it has been necessary to de-enroll a relatively small number students who decided not to disclose their vaccination status, and to commence eviction processes for another small group of unvaccinated students living on campus. Kept as last resort measures after considerable effort to liaise with students, these steps were ultimately determined to be necessary. The University is giving this group of students every opportunity to come into compliance with the public health requirements and is promptly authorizing re-enrolment for those who do. To date, several students have met the vaccination conditions and successfully re-enrolled.

In October's report to Senate, Executive advised that it had requested that information be made available to instructors that provides guidance on responding to a COVID-19 infection in an academic setting. In reply, the Provost facilitated the preparation of the Guide for Instructors on COVID Case Management in Teaching and Learning Spaces. The reference document is circulating to course instructors via Associate Deans, and shared here with Senate. Additional resources for instructors are also available at: https://www.yorku.ca/bettertogether/faculty/ .

# Executive Committee – Report to Senate

## b. Approval of Members of Senate Committees Nominated by Student Senators

The Executive Committee has approved the individuals listed below as nominated by student Senators to serve on Senate committees for the 2021-2022 governance year.

**Executive**

Parmin Rahimpoor-Marnani, Undergraduate, Health, Kinesiology and Health Science

Immaculee Uwanyiligira, Graduate**,** Liberal Arts and Professional Studies, PhD

**Academic Policy, Planning and Research**

Jina Aryaan Graduate, Graduate, Osgoode Hall Law School, JD

Naquee Blake, Undergraduate, Liberal Arts and Professional Studies, Law and Society

**Academic Standards, Curriculum and Pedagogy**

Mohamed Elsayed Elghobashy, Undergraduate, Health, Kinesiology and Health Science

Arian Kamal, Undergraduate, Education

**Appeals**

Dylan Gruspier, Graduate, Environmental & Urban Change, MES

Disha Mittal, Graduate, Osgoode, Law

Ana Kraljević, Undergraduate, Glendon, French Studies & Canadian Studies

**Awards**

Maya Adachi-Amitay, Undergraduate, Environmental & Urban Change, Environmental Studies

Kingsley Ozowe, Graduate, Schulich, MBA

**Honorary Degrees and Ceremonials**

Dhouha Triki, Graduate, Liberal Arts and Professional Studies, PhD, Gender, Feminist, & Women's Studies

**Tenure and Promotions**

Prabhjee Singh, Undergraduate, Lassonde, Computer Science

Riaz Nandan, President York Federation of Students

The Committee is grateful to all student Senators for their service to Senate and its committees.

# Executive Committee – Report to Senate

## c. Approval of Nominated Committee Members

The Executive Committee has approved the individual noted below designated by the Organized Research Units' (ORU) Council of Research Directors to serve on the Academic Policy, Planning and Research Committee effective immediately.

Elaine Coburn, Director, Centre for Feminist Research

*Remaining Senate Committee Vacancies*

The Executive Committee continues to seek prospective candidates to fill the remaining two (2) vacancies on the Tenure and Promotions Committee. The Nominations Sub-Committee would be grateful for expressions of interest, which can be conveyed to either the Vice-Chair of Senate, Chloë Brushwood Rose (brushwood-rose@edu.yorku.ca ), or the University Secretariat, through Cheryl Underhill (underhil@yorku.ca ).

## d. December Meeting of Senate

Based on a forecast of pending business for Senate, it is anticipated that it will be necessary for Senate to convene in December. In focus particularly will be time-sensitive curriculum proposals for programming at the Markham Campus. Confirmation of a December meeting of Senate will be made well before the scheduled date of Thursday, December 16. Accordingly, Senators are asked to reserve the 3:00pm meeting time on that date until a definitive announcement is made.

## e. Senate Rules Review 2021-2022

Senate Executive agreed that a review of the Rules of Senate will be one of its priorities this year, consistent with the prescribed timing for the exercise articulated in the Rules. Executive's Nominations Sub-committee is customarily tasked with developing recommendations on the Rules for the full Committee and Senate. The process typically begins with gathering suggested sections of the Rules in need of clarity, revision or editorial updating. Sources for the suggestions include:

- commentary from the Senator surveys since the last review
- observations from members of Senate Executive, the Chair of Senate and the University Secretary
- direct input from Senators about the scope of the Rules review in an email canvass

At its November meeting, Executive had a preliminary discussion of the scope of the current Rules review exercise. The deliberations will resume at its next meeting in December, to be followed by a canvass of Senators for additional aspects of the Rules

to be covered in this year's review. It is expected that Senate Executive will review a report of the Nominations subcommittee in March/April, with a recommendation to proceed to Senate at the May (Notice of Motion) and June meetings.

### f. Other Business for Which Due Notice Has Been Given

The Executive Committee considered a request submitted by Senators Uwanyiligira and Triki that seeks to have a Senate discussion of the academic implications of the *Anti-Black Racism Framework* and the draft *Action Plan on Black Inclusion*. After a lengthy discussion, the Executive Committee concluded that as currently framed the request does not set out a clear item of business for Senate. Senate Executive is liaising with the graduate student senators before confirming the discussion as an item of business and determining its readiness for Senate consideration at its meeting in December.

### g. Committee Membership 2021-2022

The Committee is pleased to welcome student members Parmin Rahimpoor-Marnani and Immaculee Uwanyiligira and looks forward to their engagement in the work of Senate Executive.

### h. Executive Committee Sub-committee on Equity

Senator Uwanyiligira will be the student member of Executive to participate on its Sub-committee on Equity. Chaired by Senator Brushwood Rose on behalf of the Chair of Senate, and joined by Professors Leslie Sanders and Sirvan Karimi, the designated members of APPRC and ASCP respectively, the Sub-committee will be convened in the coming weeks.

*Mario Roy, Chair*
Chloë Brushwood Rose, *Vice-Chair*

# Academic Policy, Planning and Research Committee

## Report to Senate

### At its meeting of 25 November 2021

# For Information

### a. Provost's Autumn Report on Complement and Enrolment

As is customary in the autumn, the Provost reports to APPRC and Senate on enrolments and faculty complements to share information on and facilitate discussion of trends in these two areas critical to program delivery, success in implementing academic strategies and progress on advancing UAP priorities. Provost Philipps previewed the report with APPRC earlier this month and gathered feedback from members. The presentation slides are attached as Appendix A.

The Provost will speak to the slides at the Senate meeting, highlighting measures being implemented in support of the Faculty Complement Renewal Strategy and performance on objectives to date. APPRC noted the continuing progress emerging from recent measures to advance diversification, specifically of minority / racialized faculty members. One of the specific objectives in the Complement Strategy is to achieve a gradual increase in faculty : student ratio institutionally. For the benefit of Senate to assess progress on that important metric, the Committee recommended current data on the ratio be included in the material. Senate will note from the material the growth in the teaching stream complement. APPRC recommended that a metric to be monitored alongside the increasing number of Teaching stream appointments is the direction of gender and racialized compositions of this cohort, which tends towards a higher proportion of women than the professorial stream. The Provost confirmed that the data on the complement distribution are being tracked, and that they are not revealing any such trend emerging within the Teaching stream.

Enrolments for FW2021-2022 are very close to targets. The Provost will speak in greater detail to the results, noting those areas where the effects of the pandemic continue to linger. APPRC considered that Senate's engagement with the enrolment results would be enhanced with an understanding of how enrolment targets for each Faculty are determined, and where the impact of not meeting targets surfaces most acutely for Faculties. The Provost will provide that context in her remarks to help set the stage for Senate's discussion of enrolment patterns and trends, and what impact the results have for the University.

### b. Markham Campus

In its report to Senate last month APPRC advised that, consistent with the Committee's responsibility for the coordination of program and policy development and consultations on major academic initiatives, the Chair was convening the senior planners working on the academic framework for the Markham campus together with the Chairs of ASCP and Senate. This group was brought together for APPRC, ASCP and Senate to be able to confirm:

- that all necessary governance actions to establish the academic programming, legislation for the new campus and to integrate campus representation on governing bodies are identified
- that governance paths for each of the actions are identified
- the hard deadlines for Senate approval on all the actions in line with the implementation stages ahead of the September 2023 campus launch
- a workable schedule for the governance reviews to meet the hard deadlines, and contingencies plans where necessary

The meeting was held in early November and the discussion was very constructive. From the collective participation and input around the table greater clarity of the various intermediate and end point deadlines was achieved and several strategies to help the Senate committees manage the number and flow of proposals through to Senate were identified. There will be careful monitoring and tracking of the progress of the proposals to the target timelines. This informal facilitating group is poised to act promptly to assist if significant delays begin to emerge in the governance review stages.

### c. Glendon Strategic Review and Revisioning

The Provost and Vice-President Academic has a standing report on APPRC agendas to raise and discuss academic initiatives with the Committee in keeping with its oversight role of academic plans and major academic policies. A specific responsibility within APPRC's mandate is to report to Senate on reviews of existing Faculties, units, centres and programs and to bring forward recommendations for changes arising from such reports. In that context, the Committee was briefed by the Provost 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 led 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.

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.

From the Committee's discussion of the initiative, the following observations were emphasized:

- the exceptionality at York of having others outside a Faculty participating in Faculty-review exercise
- that considerable research and concrete planning has been undertaken by many Glendon faculty members over the past five-years to address the enrolment decline, and the concern that the initiatives from that work that are on the cusp of moving forward are in jeopardy
- current enrolment challenges may stem at least in part to earlier periods of inadequate resourcing of recruitment plans and measures; the examination of the enrolment difficulties should be at least in part through the lens of historical resource allocations
- the need for the review process to include an examination of relationships and creation of links between Glendon and other Faculties to address the long-standing challenge of it being seen as and feeling like an isolated Faculty on a separate campus
- the University's stated commitment to equity, diversity and inclusion, and specific initiatives in support of anti-Black racism and Indigeneity, are not reflected in the composition of the external consultants hired to support the review exercise
- the importance of differentiating between funding needed to support Glendon's *campus* operations from funding needed to support its *Faculty* operations

The dialogue afforded the opportunity for fuller information about the review exercise to be provided. The Provost emphasized the University's support for Glendon in

conducting this review and creating an opportunity for colleagues to participate fully in the process. From the views expressed by the APPRC members she confirmed that:

- the goal of the academic and administrative review exercise is achieving recovery and bringing Glendon to a position of strength in the competitive post-secondary landscape
- the academic plans and initiatives recently developed by Glendon faculty members to address the enrolment challenges will be included in and provide a good foundation for the review, and will have the benefit of receiving constructive feedback from the Advisory Committee to inform decisions going forward
- a core purpose of the review is to surface ideas not thought about for consideration, including ways to amplify programming and / or identify new offerings that Glendon may want to take-up to meet student need and demand
- broadening the composition of the Advisory Committee and including external support is intended to better resource the exercise and position it to achieve its goal; the additional resources complement the knowledge and skill of the Glendon community by providing valuable context on sector developments and trends critical to academic planning
- identifying points of connection between the Glendon and Keele campuses that enhance the integration of Glendon is a key outcome sought in the review
- the review exercise is to look at both academic positioning and administrative operations; it will focus first on the former, and then how administrative operations can best support the vision going forward

APPRC looks forward to receiving progress updates on the Faculty review process, and in turn reporting to Senate on the matter.

**d. Discussion of the Draft Action Plan for the implementation of the Framework to Address Anti-Black Racism**

APPRC identified as one of its priorities for 2021-2022 to:

> Inform academic policies and directions to address anti-Black racism, strengthen Indigenous presence at the University, and further access and principles of equity, diversity and inclusion.

# Academic Policy, Planning and Research Committee
# Report to Senate (cont'd)

The specific outcome defined is for APPRC - in coordination with the Senate Executive Sub-Committee on Equity - to identify contributions to initiatives and directions for furthering anti-Black racism actions, access and principles of equity, diversity and inclusion within collegial governance realm.

To this end, the Committee will review the Action Plan to the Framework to Address Anti-Black Racism to discuss possible initiatives that align with APPRC's mandate. Any recommendations that emerge from the Committee will be taken forward to the Senate Executive Sub-Committee on Equity by APPRC's representative on that body (Professor Leslie Sanders), and in turn liaise with APPRC on defined initiatives.

A preliminary discussion of the Action Plan commenced at the Committee's meeting on 11 November, with plans to resume the dialogue and planning at its next meeting on 25 November.

**e. Welcome to New Members**

The Committee is pleased to welcome new members Elaine Coburn, the designate from the Council of (ORU) Research Directors and Jina Aryaan and Naquee Blake as the student members on the Committee.

Brenda Spotton Visano
Chair of APPRC

# Academic Standards, Curriculum and Pedagogy Committee

# Report to Senate

## At its meeting of 25 November 2021

## For Action

**a. Addition of the Markham Campus location for the Common First-year Engineering programming for the BEng degree programs in Engineering • Lassonde School of Engineering**

ASCP recommends that,

> **Senate approve the addition of the Markham Campus location for the Common First-year Engineering programming for the BEng degree programs in Engineering, housed in the Lassonde School of Engineering as set out as Appendix A, effective FW 2023-2024.**

**Rationale:**

As set out in Appendix A, a major modification is proposed to offer a first-year engineering programming at the Markham Campus that is the same curriculum as the first-year engineering program offered at the Keele Campus. The same courses and thus the same learning outcomes of the program at Keele Campus will be identical to the delivery of the program at the Markham Campus. After completing the first-year engineering program at the Markham Campus, engineering students would continue their studies in one of seven engineering specializations at the Keele Campus. In September 2023, it is anticipated that an initial cohort of 50 students at the Markham Campus, scaling up to 100 students within 5 years. The first-year engineering cohort at Keele would not change as a result of the program at Markham.

The Bachelor of Engineering (B.Eng) programs consist of a minimum of 140 credits, of which 36 credits are in the first-year. Currently, 33 credits in the first year are common to all seven engineering programs at Lassonde (civil engineering, computer engineering, electrical engineering, geomatics engineering, mechanical engineering, software engineering, space engineering). Depending on their engineering major, students take one of two courses to fulfill the other three credits in their first year of study. The

proposal includes letters of support from academic units, as well as from the Deans of the Faculty of Science and the Lassonde School of Engineering.

Complete documentation is provided as ASCP Appendix A.

**Approvals:** Lassonde Faculty Council on 17 September 2021, and ASCP 3 November 2021.

**b. Addition of the Markham Campus location for the First-year Foundational Science programming for BSc degree programs • Faculty of Science**

ASCP recommends that,

> **Senate approve the addition of the Markham Campus location for the first-year Foundational Science programming for BSc degree programs housed in the Faculty of Science, as set out in Appendix B, effective FW 2023-2024.**

Rationale:

As outlined in Appendix B, a major modification is being proposed to offer first-year foundational science courses at the Markham Center Campus which will be the same science courses currently offered at York University's main Keele campus and share identical course learning outcomes and laboratory experience. With the creation of the new York University Markham Campus, the Faculty of Science is proposing to offer first year foundational science programming in Biology, Chemistry, Math, and Physics. The proposal reflects the addition of the new location for these courses at Markham Campus. No existing programs in Science will change as a result of this addition of location. As all Science programs require foundational Science credits, these courses will satisfy all existing program requirements.

In addition to foundational Science courses, students will also have the option to complete computer science courses required for Science programs offered by Lassonde. Furthermore, there will be substantial offerings by other Faculties at Markham Center Campus allowing for elective credit selection. Thus, students will have the opportunity to complete their entire first year experience at Markham Campus if they choose. The proposal includes letters of support from academic units, as well as from the Dean of the Faculty of Science.

Complete documentation is provided as ASCP Appendix B.

Approvals: Faculty of Science Faculty Council on 14 September 2021, and ASCP 17 November 2021.

**c. Establishment of a BASc degree option in Computer Science for Software Development • Markham Campus • Lassonde School of Engineering**

ASCP recommends that,

> **Senate approve the establishment of a BASc degree option in Computer Science for Software Development at the Markham Campus, housed within the Department of Electrical Engineering and Computer Science in the Lassonde School of Engineering, set out as Appendix C, effective FW2023-2024.**

Rationale:

The major modification proposal set out as Appendix C is to establish a new BASc degree option in Computer Science for Software Development under the Bachelor of Applied Science (BASc) degree framework, with both regular and honours streams to be offered in Fall 2023 at the Markham Campus. This major has related program learning outcomes to the existing majors already offered at the Keele Campus, namely the Bachelor of Science (BSc) regular and honours streams in Computer Science. The programs focus on software development and give students options to specialize in areas such as Cloud Computing, Cybersecurity, and Data Science.

Markham is intended to be a growing hub for high-tech start-ups and multinational industry players that employ software developers. There is unprecedented student and employer demand for Computer Science programs already within York University and across Ontario. For example, applications to York's Computer Science program have risen by nearly 40% over the last 3 years, ahead of the North American trend of 3–4% increase per year shown by the CRA's Taulbee Survey. Their emphasis on learning by doing and professional skills also set them apart from their competitors.

The federal government's Employment and Social Development Agency opened up

the Global Talent Stream to provide visas to foreign workers in highly skilled occupations that have been determined to be in-demand and for which there is insufficient domestic labour supply. Of the 12 occupations on the list in May 2021, the majority are related to computer science, including software designers, computer programmers, web developers, computer systems managers and database analysts.

Permeating all six priorities of the University's Academic Plan (UAP), "is a theme of coming together as both a precondition and an outcome of fulfilling the plan. A better future must be rooted in strong relationships – among the members of our own institution, across our multiple campuses, with our closest neighbours and Indigenous communities, and with our burgeoning networks of partners near and far." The proposed programs connect with the Markham community, other programs at the Markham Campus, and the Computer Science programs at the Keele Campus. The programs are expected to contribute to at least four of the six priorities of the UAP namely, 21st Century Learning: Diversifying Whom, What, and How We Teach; Knowledge for the Future: From Creation to Application; From Access to Success: Next Generation Student Supports; and Working in Partnership. The proposal includes letters of support from academic units, as well as from the Deans of the Faculty of Science and the Lassonde School of Engineering.

Approvals: Lassonde Faculty Council on 5 November 2021 and ASCP on 17 November 2021.

Complete documentation is provided as ASCP Appendix C.

## For Information

**e. Minor Modifications to Curriculum**

*Faculty of Science*

Minor Changes to Degree Requirements for the BSc program in Environmental Biology

Minor Changes to Degree Requirements for the BSc program in Biology, Biomedical Science Stream

# Academic Standards, Curriculum and Pedagogy Committee
# Report to Senate

## f. Markham Campus Update

ASCP has begun to receive proposals for the curriculum programming at Markham Campus. In order to accommodate the proposals in addition to the normal business of the Committee, ASCP is planning to schedule half day-long workshops in December and January and further meetings will be scheduled as deemed necessary.

In addition, a group consisting of the senior planners working on the academic framework for the Markham Campus met together with the Chairs of ASCP and Senate and was convened by the Chair of the Academic Policy, Planning and Research Committee (APPRC). The purpose of this meeting was to identify the governance actions, schedule, and paths to establish the academic programming and legislation for the new campus. Details on the outcomes from that discussion are in the APPRC Report to Senate in the agenda package.

Martin Bunch, Chair

## Major Modifications Proposal – Addition of Markham Location for programs/portions of programs

The Vice Provost Academic, in consultation with the Secretary to ASCP, has created an abbreviated major modification template to accommodate Faculty proposals to offer a portion of one or more degree programs (25%, one-year of a four-year program or 30 credits) at the Markham Centre Campus, which is scheduled to enrol its first cohort in September, 2023.

Under YUQAP, a change in the location where a program is offered constitutes a major modification. The abbreviated template is responsive to the need for a process for a change in location while also acknowledging that the change does not fall within the definition of program as set out by YUQAP. It is important that our YUQAP processes are brought to bear on academic activities that come under the purview of Senate.

All aspects of any program that will offer a portion at the new campus have been approved by normal processes. The use of this template is restricted to the change of location of a portion of a program or programs as defined above.

1. **Faculty:** Lassonde School of Engineering

2. **Departments:** Office of the Dean

3. **Program:** First-year engineering (common to civil engineering, computer engineering, electrical engineering, geomatics engineering, mechanical engineering, software engineering, space engineering)

4. **Degree Designation**: Bachelor of Engineering (B.Eng.)

5. **Type of Modification:** Addition of Markham Centre Campus location

6. **Effective Date:** September 2023

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7. Provide a description of the proposed offering, how (if at all) it differs from Keele offerings, how many students are expected to participate and, where relevant, how students who complete the program will be integrated into second year, or how students moving to Markham will be prepared for a move.

   **Description of the Proposed Offering**

   The Bachelor of Engineering (B.Eng) programs consist of a minimum of 140 credits, of which 36 credits are in the first-year. Currently, 33 credits in the first year are common to all seven (7) engineering programs at Lassonde (civil engineering, computer engineering, electrical engineering, geomatics engineering, mechanical engineering, software engineering, space engineering). Depending on their engineering major, students take one of two courses to fulfill the other three credits in their first year of study.

The proposed offering is a first-year engineering program at the Markham Centre Campus that is the same curriculum as the first-year engineering program at the Keele Campus. Meaning, the same courses and thus the same learning outcomes of the program offering at Keele Campus will be the same for the delivery of the program at the Markham Centre Campus. After completing the first-year engineering program at the Markham Centre Campus, engineering students would continue their studies in one of seven engineering specializations at the Keele Campus.

In September 2023, we anticipate an initial cohort of 50 students at the Markham Centre Campus, scaling up to 100 students within 5 years. The first-year engineering cohort at Keele would not change as a result of the program at Markham.

**Course Offerings**

The following courses are planned for delivery at Markham Campus, consistent with the first-year engineering offerings at Keele Campus.

| **Course Number** | **Course Title** |
|---|---|
| CHEM1100 | Chemistry and Materials Science for Engineers |
| EECS1011* | Computational Thinking Through Mechatronics |
| EECS1021* | Object Oriented Programming from Sensors to Actuators |
| EECS1028 | Discrete Mathematics for Engineers |
| ENG1101* | Renaissance Engineer 1: Ethics, Communication and Problem Solving |
| ENG1102* | Renaissance Engineer 2: Engineering Design Principles |
| ESSE1012* | The Earth Environment |
| MATH1013 | Applied Calculus I |
| MATH1014 | Applied Calculus II |
| MATH1025 | Applied Linear Algebra |
| PHYS1800 | Engineering Mechanics |
| PHYS1801 | Electricity, Magnetism and Optics for Engineers |

*These courses are to be taught by Lassonde faculty.

The curriculum being offered in fall 2023 at Markham Centre Campus will be identical to the curriculum being offered at Keele campus.

8. 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.

**Faculty Resources**

For the effective delivery of the first year engineering program at the Markham Centre Campus, congruent with enrolments, we plan to initially hire one to two full time faculty members, holding their professional engineering designation (P.Eng) prior to the start of the course offerings at Markham. We will allocate part-time faculty and teaching assistants as required.

**Support Services**

Shared Lassonde faculty administrative supports are planned for the delivery of all Lassonde programs to launch in fall 2023 at the Markham Centre Campus. Student support will be provided via Lassonde staff and shared centralized Markham Centre student services staff. The courses which include components of experiential education will be supported by Lassonde staff. Shared services such as Libraries, IT, Counselling, Careers, and more, will be available for students.

**Facilities / Equipment:**

Physical spaces at Markham Centre Campus have been allocated with the intention that they will be shared with other programmatic offerings, including first year engineering, first year science, and other programs in computer science. As part of the first-year engineering curriculum, there are courses that have required laboratory components. The Markham Centre Campus plans include teaching laboratories for first year science offerings by the Faculty of Science, and these laboratories are expected to also serve courses in the first-year engineering curriculum. We have been in consultation with the Faculty of Science; the Physics and Chemistry labs will be provided, similar to Keele, and will support our enrolment plan. There are four computer labs that are assigned to the Department of Electrical Engineering and Computer Science that will also facilitate labs in first-year engineering.

In addition to these spaces, there are spaces for research, faculty offices (marked to be used by Lassonde). Other spaces at MCC include (shared/common spaces) including RAC classrooms, informal learning spaces (Student Services), student government space (Student Services), Assembly and Exhibition Facilities (Student Services), library and study Spaces (Library).

9. Briefly outline the consultation undertaken with relevant academic units that may be impacted by this move.

We have discussed the proposed first year engineering offerings at Markham Centre Campus within the School of Engineering, and greater York University stakeholders. Moreover, ongoing discussions are taking place on a regular basis (monthly) which include stakeholders from the Faculty of Science.

In brief, some of the consultation internal to members of the Lassonde community that has taken place to date:

- October 21, 2020: Dan Palermo (LSE Vice Dean) confirmed at LCS that Jeff Harris, Director of First-Year Engineering, is the lead proponent for first-year engineering program at Markham.

- November 6, 2020: Vice Dean, Dan Palermo, presented at LSE Faculty Council around the total Lassonde footprint planned for MCC.

- November 18, 2020: EC² presented to LCS the Engineering Common Curriculum committee priorities, including that EC² will plan and coordinate the course delivery for first-year engineering at Markham.

- January 29, 2021: Salvatore Paneduro (Director, Educational Innovation) and Chris Donaldson (Manager, Quality Assurance & Accreditation) met with Julie Parna (Director, Academic Programs and Policy) and confirmed that the process to add first-year engineering at MCC requires this abbreviated major modification form.

- April 7, 2021: Jeff Harris presented the major modification for the inclusion of MCC as a campus of study for the delivery of first-year engineering to the Engineering Common Curriculum (EC2) committee.

- April 21, 2021: Jeff Harris presented the major modification to the Learning, Curriculum, and Students (LCS) committee for review and approval.

- June 4, 2021: Vice Dean, Dan Palermo and Jeff Harris presented the major modification to the Planning, Academic Resources & Research (PARR) Committee for review and approval.

# MEMO

**TO:** Hillary Barron, Assistant Secretary to the University

**FROM:** Dean's Office, Lassonde School of Engineering

**CC:** Jeffrey Harris, Director of Common Engineering & BSc Science
Alice Pitt, Senior Advisor, Markham Academic Strategic Planning

**SUBJECT:** First Year Engineering Calendar Copy

**DATE:** October 28, 2021

**First Year Engineering Program**

All Specialized Honours Bachelor of Engineering (BEng) degree candidates enrolled at the Markham Centre Campus must complete the following first year engineering program courses:

- SC/CHEM 1100 4.00;
- LE/EECS 1011 3.00; LE/EECS 1021 3.00;
- LE/ENG 1101 4.00; LE/ENG 1102 4.00;
- SC/MATH 1013 3.00; SC/MATH 1014 3.00; SC/MATH 1025 3.00;
- SC/PHYS 1800 3.00; SC/PHYS 1801 3.00;
- All BEng degree candidates in computer, electrical and software engineering programs must complete: LE/EECS 1028 3.00;
- All BEng degree candidates in civil, geomatics, mechanical and space engineering programs must complete: LE/ESSE 1012 3.00.

LASSONDE SCHOOL OF ENGINEERING | YORK UNIVERSITÉ UNIVERSITY

OFFICE OF THE DEAN
Suite 204 · Bergeron Centre for Engineering Excellence
4700 Keele Street · Toronto · Canada · M3J 1P3

# MEMO

**TO:** Franck van Breugel, Chair of Faculty Council

**FROM:** Jane Goodyer, Dean, Lassonde School of Engineering

**CC:** Jeff Harris, Director of Common Engineering & BSc Science
Dan Palermo, Vice Dean, Lassonde School of Engineering
Pam Edgecombe, Secretary of Faculty Council

**SUBJECT:** Statement of Support for First Year Engineering at Markham

**DATE:** June 4, 2021

I am pleased to express my support for the new programming our Lassonde School of Engineering has planned for the Markham Centre Campus to launch in fall of 2023, including the First Year Engineering program. The delivery of this program is in line with York University's strategic priorities with a commitment to the Markham community in providing increased access to technology, science, and engineering-related programming. These investments are being made at an institutional level to grow and expand York's presence in the Markham region, and it is envisioned that these will provide new pathways to programs at York, specifically in science and engineering. This is engaging and raising the profile of Lassonde as we are looking to grow and increase our market share within the Ontario post-secondary education system.

In Lassonde, we are building a faculty complement plan with 24 dedicated faculty positions to complement the Department of Electrical Engineering and Computer Science, which includes teaching stream and professorial stream faculty hires. With anticipated steady-state enrolments of ~400 students in each of our new Computer Science for Software Development and Digital Technologies programs already proposed by this department for delivery at Markham, we anticipate first year engineering with steady state enrolment of 100 students to comprise a small component of Lassonde's total footprint at the new campus. Lassonde is planning for one to two dedicated faculty positions as part of the total faculty complement planned at Markham for the delivery of the First Year Engineering program.

Lassonde will participate in a suite of shared administrative supports that are planned for the delivery of all Lassonde programs to launch in fall 2023 at the Markham Centre Campus. This will include dedicated supports for program delivery, work integrated learning, technical staff, operations and advising. Student supports will be provided via a combination of Lassonde staff, along with shared centralized Markham Centre student services staff. Libraries, information technology, counselling, career services, and more, will be available and provided for students

through a shared-service delivery model similar to the structure that is provided on the Keele Campus.

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**FACULTY OF SCIENCE**

**Office of the Dean**

**Michael Scheid**
Associate Dean Students

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November 1, 2021

Dr. Dan Palermo
Vice Dean, Lassonde School of Engineering
York University

Dear Dr. Palermo,

Re: First Year Engineering Core Program

I have reviewed the First Year Engineering Core Program. I can confirm that we will have the necessary faculty complement and laboratory infrastructure to support delivery of this first-year program - CHEM1100 4.0 – Chemical and Material Science for Engineers; EECS1028 3.0 – Discrete Mathematics for Engineers; MATH1013 3.0 – Applied Calculus I; MATH1014 3.0 – Applied Calculus II; MATH1025 3.0 – Applied Linear Algebra; PHYS1800 3.0 – Engineering Mechanics; PHYS1801 3.0 – Electricity, Magnetism and Optics for Engineers.

We are excited to contribute to this first-year program and are looking forward to collaborating with Lassonde at Markham Campus.

Kindest regards,

Michael Scheid, Associate Dean, Students

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**DIVISION OF STUDENTS**

**Office of the University Registrar**

**Darran A. Fernandez**
University Registrar

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November 2, 2021

To: Academic Standards, Curriculum and Pedagogy Committee

RE: Proposal for First-Year Engineering at Markham

The proposal for the first-year engineering program at Markham has been reviewed by the Office of the University Registrar.

We support this proposal and look forward to working collaboratively with the Lassonde School of Engineering on the implementation details in support of their requirements.

Sincerely,

Darran Fernandez

Darran A. Fernandez, M.Ed.
University Registrar
York University

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# Memorandum

To: Prof. Jeffrey Harris

From: Joy Kirchner, Dean of Libraries

Date: October 8, 2021

Subject: Bachelor of Engineering (B.Eng.) First Year Core Program Library Support

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York University Libraries (YUL) is well-positioned to support the curriculum and research needs of students and faculty in the proposed Bachelor of Engineering (B.Eng.) First Year Core program at York University's Markham Campus. As noted in the Statement of Library Support, YUL provides access to an extensive array of resources and services that support the academic and experiential engagement of students and faculty in this program. I draw your attention to YUL's curriculum integration offerings, digital literacy programs and specialized programming offered through our digital scholarship centre.

We look forward to contributing to the success of students and faculty in the Bachelor of Engineering (B.Eng.) First Year Core program at the Markham Campus of York University.

cc: Patti Ryan, Director, Content Development and Analysis,
Jack Leong, Associate Dean of Libraries, Research and Open Scholarship
Andrea Kosavic, Associate Dean of Libraries, Digital Engagement and Strategy

**B.Eng. First-Year Engineering**
**Library Statement of Support**

**October 2021**

This statement of library support for the proposed B.Eng. First-Year Engineering program (common to civil engineering, computer engineering, electrical engineering, geomatics engineering, mechanical engineering, software engineering, space engineering) has been prepared in accordance with the guidelines outlined in the Quality Assurance Framework as set out by the Ontario Universities Council on Quality Assurance. It describes some of the services and levels of support that York University Libraries (YUL) will be able to provide to students and faculty at the Markham Centre Campus. YUL supports all programs through immersive spaces, diverse collections, instructional services, research assistance, access to knowledge resources, expertise with research dissemination and adaptive services.

This new B.Eng. First-Year Engineering program provides academic and research opportunities in line with the Markham Campus' focus on technology, entrepreneurship, management and communications. York University Libraries embraces this approach with Markham Centre Campus Library (MCCL) programs and services that support multimodal learning through program-integrated offerings of technology, space and expertise. MCCL embeds library instruction and proficiency with immersive spaces including media capture and editing suites, a makerspace, VR capabilities, a gaming lab, and a visualization wall, all developed to support creative collaborations for teaching, learning, research and community partnerships. From a rich and diverse collection of print and electronic resources and tools, to one-on-one consultation services, instructional sessions, co-curricular offerings and group study spaces, the Libraries are well-positioned to support student success in what promises to be a rich, intensive program of study.

An overview of relevant York University Libraries services and resources for students and faculty is provided in subsequent sections.

**Library Curriculum Integration for B.Eng. First-Year Engineering**

Information Literacy (IL) encompasses the skills to find, retrieve, evaluate, use and produce academic, professional and creative work. It enables students to participate fully in a university environment and a disciplinary culture. IL integration strengthens alignment with Degree Level Expectations and the seven defined categories of broad knowledge and skills integral to Ontario's Quality Assurance Framework.

Scaffolding IL instruction is most effective when organized at the program level as it eliminates duplication, improves assignment outcomes, and enables students to apply their learning. IL instruction spans many areas including digital methods, digital tools, data visualization, copyright, privacy and security. Based on ACRL's Framework for IL for Higher Education, and years of experience, we suggest

integrating library instruction into same first year courses as for the Keele Campus first year cohort, the disciplinary introduction ENG 1101 Renaissance Engineer 1: Ethics, Communication and Problem Solving and/or ENG 1102 Renaissance Engineer 2: Engineering Design Principles. Once students move to the Keele Campus for their second year and beyond, they will be part of that cohort and receive IL instruction as part of various other courses.

Instructors are encouraged to take advantage of dedicated, in-class sessions that can be tailored to course material or assignments. A wide range of programming is available, including digital and information literacy, blended learning modules, co-curricular programming, open educational resources and student seminars. Students in data science programs may benefit from dedicated, in-class workshops related to developing and implementing search strategies, tracking and correctly citing data sources, and managing collections of reference materials and citations. In-class sessions should be organized and booked in advance of each semester's offerings, and requests can be submitted at https://classrequests.library.yorku.ca/

**Digital Scholarship Centre and Specialized Programming**

To discuss curriculum integration in the areas of digital scholarship, digital cultures and pedagogy, data management, open education, or scholarly publishing, YUL welcomes faculty to contact the Digital Scholarship Centre. The Digital Scholarship Centre (DSC) at York University Libraries houses knowledge in a range of digital tools and methods for web crawling and scraping, data cleaning, data curation, text processing and analytics, social graph analysis, data visualization, and linked open data applications, with an emphasis on sustainable, low-barrier approaches and open-source tools. The Digital Scholarship Centre draws expertise from a variety of departments within York University Libraries. The Digital Scholarship Infrastructure (DSI) supports students and faculty seeking assistance with digital scholarship and digital humanities projects, open repositories, digitization best practices, digital preservation, research project design, eLearning, and Open Educational Resources. The department also hosts a data services team that can provide guidance on how to find and evaluate aggregated data and microdata sources for research projects as well as on how to document, publish, and preserve research data objects.

**Immersive Spaces at Markham Centre Campus Library**

The **Media Creation Spaces at MCCL** offer equitable access to library expertise and media creation spaces including audio and video recording equipment, audio-visual media creation spaces and editing suites, portable virtual reality headsets, and workstations for hands-on digital media production work. The Digital Scholarship Centre offers resources for faculty members seeking to integrate audio- and video-based assignments and activities into their courses and enables media literacy skills development in support of coursework and capstone projects.

The **Makerspace at MCCL** is a site for critical making, offering a research and learning environment where students and researchers have access to 3D printers, electronic textiles, sewing machines, electronics and robotics. This large space is configured as a teaching environment and can accommodate

in-class learning. Library makerspace programming fosters key digital, social, and cross-disciplinary fluencies such as critical and creative thinking, research skills, project planning and management, professional communication, the ability to work in multidisciplinary teams, and adaptability to new contexts and circumstances.

The **Visualization Wall, Gaming Lab and Virtual Reality (VR) Lab** are in a single dynamic, configurable space, with the Visualization Wall augmenting VR and gaming experiences. The Visualization Wall, with a massive viewable area of 28 x 14 feet, allows for enhanced research and teaching applications such as the visualization of large data sets, engagement with sophisticated software platforms, and detailed viewing and modelling of complex structures. The gaming capabilities of the space are leveraged to factor in backwards compatibility for legacy equipment for instructors and allow multiple users to concurrently engage with the visualization wall in a variety of configurations.

**Library Resources**

York University Libraries have robust and multidisciplinary collections that are responsive to emerging curriculum and research needs. We have adopted an “e-preferred” approach for new content, meaning that any requests for new titles will be fulfilled with e-book purchases whenever available or affordable, and with as few access restrictions as publishers will allow.

Print materials relevant to the programs can also be found via OMNI, and York community members can arrange to have materials held at any of our libraries. Aside from York’s collection, our partnership with the OMNI network provides students and faculty members with access to print materials housed at any of our 14 partner institutions across Ontario.

**Relevant Databases, Indexes, and Data Sources**

Many of the courses in the program will focus on diverse topics in engineering and related disciplines such as computational thinking, mathematics, physics, chemistry, engineering design and others. To inform their work, students will require access to technical books and manuals, scholarly journal and conference articles, material properties, and standards among other types of documents. The breadth of the program spans many disciplines, all of which can be addressed with elements of the York University Libraries collections.

The Libraries provide access to hundreds of thousands of journals, the vast majority of which are accessible online. Articles are discoverable through the OMNI or through the Libraries' extensive set of article databases such as IEEE Xplore and various other publisher digital libraries. Students in the B.Eng. First-Year Engineering program will also benefit from a range of more domain-specific tools and platforms including Access Engineering and Engineering Workbench for standards.

**Program-Related Research Guides**

York University Libraries publishes research guides related to disciplines and topics addressed by York programs. Librarians can also create customized research guides to help with individual courses or

assignments, usually as part of an IL session as described above. Existing guides of interest to this program are:

Engineering: https://researchguides.library.yorku.ca/cse
Geospatial Data: https://researchguides.library.yorku.ca/geospatial
Science and Technology Studies: https://researchguides.library.yorku.ca/sts
Digital Scholarship and Digital Humanities: https://researchguides.library.yorku.ca/dsdh

**Email, Chat, and Consultation Services**

In-person assistance with research, citation and other information is readily available from York University Libraries. Currently, online support is available through text messaging, email or through our online chat or drop-in zoom service. Students in this program may also take advantage of our consultation service, where individuals or groups meet with a librarian to discuss specific assignment- or research-related questions or any other topic. These consultations are available at regular hours throughout the week, and can be booked online at https://www.library.yorku.ca/web/ask-services/book-a-consultation-with-a-librarian/

**Conclusion**

York University Libraries is well positioned to support the curriculum and research needs of students and faculty in the proposed B.Eng. First-Year Engineering program at York University. Our external partnerships and collaborative collection building initiatives with other universities have positioned YUL to support the emerging needs of the students and faculty of this program in the ever-changing and complex scholarly communications landscape. Our external partnerships and collaborative, multi-institutional collection building and the many programs and services mentioned above will contribute to the success of this new program in the years to come.

Last updated: 21/01/2020

## Major Modifications Proposal – Addition of Markham Location for programs/portions of programs

The Vice Provost Academic, in consultation with the Secretary to ASCP, has created an abbreviated major modification template to accommodate Faculty proposals to offer a portion of one or more degree programs (25%, one-year of a four-year program or 30 credits) at the Markham Centre Campus, which is scheduled to enrol its first cohort in September, 2023.
Under YUQAP, a change in the location where a program is offered constitutes a major modification. The abbreviated template is responsive to the need for a process for a change in location while also acknowledging that the change does not fall within the definition of program as set out by YUQAP. It is important that our YUQAP processes are brought to bear on academic activities that come under the purview of Senate.
All aspects of any program that will offer a portion at the new campus have been approved by normal processes. The use of this template is restricted to the change of location of a portion of a program or programs as defined above.

1. Faculty: Science
2. Department/s: Biology, Chemistry, Mathematics & Physics
3. Program/s: 1st year Science Offerings
4. Degree Designation: No degrees being offered; first year courses only.
5. Type of Modification: addition of Markham Centre Campus location
6. Effective Date: September 2023

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7. Provide a description of the proposed offering, how (if at all) it differs from Keele offerings, how many students are expected to participate and, where relevant, how students who complete the program will be integrated into second year, or how students moving to Markham will be prepared for a move.

### Description of the Proposed Offering

With the creation of the new, York University Markham Center Campus, York Region's first public University campus, we propose to offer first year foundational science programming in Biology, Chemistry, Math, and Physics. The first-year foundational science courses we propose to offer at the Markham Center Campus will be the same science courses currently offered at York University's main Keele campus and share identical course learning outcomes and laboratory experience. This proposal reflects the addition of location of these courses to Markham Center Campus, and no existing programs in Science will change, as a result of this addition of location. As all Science

programs require foundational Science credits, these courses will satisfy all existing program requirements.

In addition to foundational Science courses, students will also have the option to complete computer science courses required for Science programs offered by Lassonde. In additional there will be substantial offerings by other Faculties at Markham Center Campus allowing for elective credit selection. Thus, students will have the opportunity to complete their entire first year experience at Markham Center Campus if they choose.

## Planned Offerings

We propose that for students entering first year Science at York University they will have a choice on program location for first year. They may choose to complete their first year at Markham Center Campus, or at the main Keele campus. The Science first year course offerings will be the same course offerings at Keele.

We suggest the first year Science program at Markham be promoted for students with an undecided or undeclared major to allow them to better discover their interests and strengths in a smaller campus environment.

The planned first year foundational Science offerings at Markham Center Campus include:

| Course Code | Course Name |
|---|---|
| **BIOL 1000 (3.0)** | Biology I- Cells, Molecular Biology and Genetics |
| **BIOL 1001 (3.0)** | Biology II-Evolution, Ecology, Biodiversity and Conservation Biology |
| **CHEM 1000 (3.0)** | Chemical Structure |
| **CHEM 1001 (3.0)** | Chemical Dynamics |
| **PHYS 1421 (3.0)** | Physics with Life Science Applications 1 |
| **PHYS 1422 (3.0)** | Physics with Life Science Applications 2 |
| **MATH 1013 (3.0)** | Applied Calculus I |
| **MATH 1014 (3.0)** | Applied Calculus II |

| | |
|---|---|
| **MATH 1506 (3.0)** | Mathematics I for the Biological and Health Sciences |
| **MATH 1507 (3.0)** | Mathematics II for the Biological and Health Sciences |

## Expected Student Participation

The table shows predicted student enrolments for first year Science at Markham Campus. Our model is based on a phased in approach with an intake beginning at 48 in the inaugural year of Markham campus in 2023, with enrollments doubling each year, until the reach capacity at 300 in 2026. The projections described are based on assumptions made by the Faculty of Science Enrollment Plan.

| Markham | Year | Enrollment Projections |
|---|---|---|
| **Inaugural Year** | 2023 | 48 |
| **Yr .2** | 2024 | 96 |
| **Yr. 3** | 2025 | 144 |
| **Yr. 4** | 2026 | 192 |

## Integration into Second Year at Keele Campus

Students who register for any Science program at York University may choose to complete their first year in Science at the Markham Center Campus. After the completion of their first year, they will continue their degree progression at the Keele Campus for the remainder of their program.

8. 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.

## Faculty Resources

For the new, York University Markham Center Campus we plan on hiring four full time teaching stream faculty. As of November 2020, the Faculty of Science has two active job postings for these positions. The first job posting is in the Department of Biology, and it is planned that this hire will teach first year Biology. The second posting is in the Department of Mathematics & Statistics, and it is planned that this hire will teach first year Mathematics & Statistics courses and take on the administrative role of first year science at Markham. Hires to deliver the Physics and Chemistry components for first year are planned by 2023. After this, the hiring plan is rolling based on projected enrolment. With our hiring we will also pay close attention to mentorship, effective teaching and curricula skills to ensure the faculty complement has the depth and breadth necessary to deliver an innovative and effective program at Markham.

## Role of Retired and Contract Instructors

The program in first year Science program at Markham will be a new program and as such there will be no retirees. We anticipate contract instructors to be a very small role in the delivery of the program. The part-time contract instructors are planned to be hired to mainly fill sabbatical leave teaching needs.

## Laboratory Facilities/Equipment

The new building at Markham campus housing first year Science will have all the required space for teaching and laboratories. Brand new purpose-built laboratory facilities and equipment will be ready for opening day in Fall 2023.

All Specialized laboratories facilities for teaching have been planned to include, both wet and dry laboratory spaces. This includes:

- 120 square meter (sm) Biology labs for teaching 24-student.
- 120 sm Chemistry lab to accommodate 24 student sections for demonstrations in, with fume hood access and flammable storage.
- 120 sm dry Physics lab has been designed to accommodate 24 student sections for demonstration in physics with modular bench space.

## Space

The Markham Center Campus will feature multiple lecture and active learning environment areas. For large lectures, there are two 135 seat (308 sm) tiered lecture halls with 2 rows of seats per tier (the first row of seats on a tier can rotate for group work with 2nd row). These two halls are separated by a movable partition to allow creation of a single 270 seat, 616 sm tiered lecture hall.

In addition, there is a 125-seat tiered lecture hall, several 50 seat tiered lecture halls, several 50-person occupancy, flat floored classrooms with movable tables and chairs, and several 35-person occupancy, flat floored classrooms with movable tables and

chairs. All classrooms and lecture halls have complete audio/video service, internet and whiteboards for instruction.
The YUMCC will have numerous common areas for informal student gatherings and independent study.

## Support Services

The support services can be broken down into three categories: (1) Laboratory Support, (2) IT support, and (3) Library Facilities.

Laboratory Support

Laboratory technical support staff will be hired to support the first cohort of students, in 2023. In subsequent years, additional laboratory support will be hired based on enrollments. The role of the laboratory support will be to: (1) setup, operational and maintenance of laboratories for program courses, (2) demonstrations of experiments in laboratory courses, and (3) safety training for students in laboratories.

IT Support

The IT support for the department will be primary managed by university-wide facilities.

Library Facilities

We anticipate university-wide library facilities will meet the needs of our first year Science students, and associated faculty.

9. Briefly outline the consultation undertaken with relevant academic units that may be impacted by this move.

We have discussed the proposed first year foundational science offerings at Markham Center Campus extensively within the Faculty of Science, and greater York University stakeholders. Consultation have been undertaken with relevant academic units that will be impacted by offerings at Markham Center Campus, including the Departments of Biology, Chemistry, Mathematics & Statistics, and Physics.

Mark Bayfield, the Markham Center Campus Special Advisor to the Dean of the Faculty of Science has meet with stakeholders for the first-year science program at Markham, including representatives from each of the impacted F.Sc. departments as well as other programs whose students may/will also be taking these courses (see list, below). Meetings in this list with Deans and Alice Pitt were about both 1st year and the post-undergrad credential; all the meetings with the chairs of departments and the

Lassonde meeting were only about the Markham first-year program.

a) Met with Paula Wilson, UPD and Robert Tsushima, Chair of Biology: February 7th, 2020
b) Met with Rene Fournier, UPD of Chemistry, February 10th, 2020
c) Met with Marshall McCall, Chair of Physics, February 12th, 2020
d) Met with Paul Szeptycki, Chair of Math&Stats & Jane Hefferman, March 9th, 2020
e) Met with Gloria Orchard and Matt George, Physics labs coordinators to discuss Physics labs at Markham, March 19th, 2020
f) Met with Pamela Edgecombe, Director Strategic Policy and Planning & Dan Palermo, Associate Dean Students, Lassonde, April 20th, 2020
g) Met with F.Sc. Dean and leadership team, May 13th 2020
h Met with Stephen Watson, Chair of Math&Stats, July 2nd, 2020
i) Met with F.Sc. Dean and leadership team, July 13th 2020
j) Met with Alice Pitt and Programs & Curriculum Working Group, November 9th, 2020
k) Met with F.Sc. Dean and leadership team, November 18th 2020

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**FACULTY OF SCIENCE**

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October 14, 2021

Dear Dr. Bayfield,

We have received your Major Modifications Proposal for the creation of a 1st Year Science Offerings program for the Markham Campus starting in September, 2023. We support this proposal and will support your efforts however we can, including continued assistance from the Faculty Education Development Specialist, as well as navigating through the official approval process, which includes Faculty Curriculum Committee, Faculty Council and Senate approval. We believe there will be strong demand for our first year science courses at Markham, after which students will complete their B.Sc. degrees at the Keele campus, and this program aligns with our newly approved Strategic Objectives. We have already initiated complement hiring for this program, will continue to support the complement and staff requirements associated with the program as detailed in the proposal, and will discuss any additional resources that may arise as you continue to develop this program.

Sincerely,

Rui Wang
Dean, Faculty of Science

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**DIVISION OF STUDENTS**

**Office of the University Registrar**

**Darran A. Fernandez**
University Registrar

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darran@yorku.ca

November 2, 2021

To: Academic Standards, Curriculum and Pedagogy Committee

RE: Proposal for First-Year Science at Markham

The proposal for the first year science program at Markham has been reviewed by the Office of the University Registrar.

We support this proposal and look forward to working collaboratively with the Faculty of Science on the implementation details in support of their requirements.

Sincerely,

Darran Fernandez

Darran A. Fernandez, M.Ed.
University Registrar
York University

YORK UNIVERSITY LIBRARIES

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# Memorandum

To: **Mark Bayfield**

From: Joy Kirchner, Dean of Libraries

Date: November 12, 2021

Subject: Library Support for 1st year Science Courses in the Departments of Biology, Chemistry, Mathematics & Physics

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York University Libraries (YUL) is strongly positioned to support the curriculum and research needs of students and faculty of the 1st year science courses in the Departments of Biology, Chemistry, Mathematics & Physics at the Markham Campus. As noted in the Statement of Library Support, YUL provides access to an extensive array of expertise, resources and services that support students and instructors, inclusive of experiential education, for those engaged in the Science Courses. I draw your attention to the new Markham Campus Centre Library (MCCL) spaces that will provide immersive, technology enhanced media creation spaces for students to enhance their learning experience. I also highlight YUL's curriculum integration offerings, particularly the digital literacy programs for the sciences, and other data management and data visualization consultations available through our digital scholarship centre.

We look forward to contributing to the success of students and faculty in the 1st year science courses in the Departments of Biology, Chemistry, Mathematics & Physics for the Markham Campus at York University.

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**Faculty of Science: Biology, Chemistry, Mathematics, and Physics First-Year Foundational Program Offering at Markham Campus - Statement of Library Support**

**September, 2021**

This statement of library support for the *Major Modifications proposed to the Faculty of Science Biology, Chemistry, Mathematics, and Physics First-Year Foundational Program* by the addition of the Markham Campus location has been prepared in accordance with the guidelines outlined in the Quality Assurance Framework as set out by the Ontario Universities Council on Quality Assurance, even though a change of location does not make it a new program as set out by the YUQAP. This statement does, however, describe some of the services and levels of support that York University Libraries (YUL) will be able to provide to science students and faculty at the Markham Centre Campus. YUL supports all programs through providing immersive spaces, diverse collections, instructional services, access to knowledge resources, and adaptive services.

As the foundational courses offered at the Markham location will be the same in content as the offerings for first year science students at Keele Campus, this statement will focus on how library support will be extended to students and faculty on the Markham Campus, and what the support will look like. The benefit of integrating library programming into the new foundational courses is that students will have the benefits of the unique multimodal learning that offers technology, space, and expertise fundamentally integrated with program offerings. The technologies available at Markham Centre Campus Library (MCCL), including media capture and editing suites, Virtual Reality capabilities, and the visualization wall will enable creative collaborations for students and faculty. The interdisciplinary nature of the foundational program aligns well with the York University Libraries cross-disciplinary approach to collections and services, and students will benefit from the technologies that are unique to MCCL. From a rich and varied collection of print and electronic resources and tools, to one-on-one consultation services, instructional sessions, co-curricular offerings, and group study spaces, the Libraries are well-positioned to support student success in what promises to be a rich, intensive First Year experience for these science students.

An overview of relevant York University Libraries services and resources for students and faculty is provided in subsequent sections.

## Library Curriculum Integration for First Year Science Students

Information Literacy encompasses the skills to find, retrieve, evaluate, use, and create information which enables students to participate fully in the university environment and their disciplinary culture. IL integration strengthens alignment with Degree Level Expectations and the seven defined categories of broad knowledge and skills integral to Ontario's Quality Assurance Framework.

Scaffolding information literacy instruction is most effective when it is introduced either in or alongside the foundational courses of a program as it levels the playing field for students who may or may not have received such instruction in high school and provides all students with transferable skills. It improves assignment outcomes and enables students to apply their learning from the start of their

program, thus eliminating duplication and catch-up efforts in upper-level courses. Information Literacy in science spans many areas including:

- Understanding the publication cycle in science and learning to recognize various publication types
- Understanding the different publication and communication cultures of the different disciplines; biology, chemistry, physics and mathematics
- Locating and searching science-based information sources for reliable information and data from both proprietary and openly accessible sources
- Lab report writing and data management
- Managing search results using bibliographic management software such as Mendeley (more commonly used in the sciences and health) or Zotero (more commonly used in the social sciences and humanities)
- Academic integrity and citing one's sources using Council of Science Editors style.

Based on ACRL's Framework for IL for Higher Education, and years of experience, we suggest integrating library instruction into a few of the assignments of the first year courses to build these foundational skills in a relevant context that can be immediately applied and transferred to assignments of other courses. Instructors are encouraged to take advantage of dedicated, timing-sensitive sessions offered either in-class or in conjunction with a class, that can be tailored to course materials and assignments. A wide range of programming is available, including digital and information literacy, blended learning modules, co-curricular programming, open educational resources, and student seminars.

Students in science programs will benefit from dedicated workshops related to developing and implementing search strategies, tracking and correctly citing data sources, and managing collections of reference materials and citations, and correctly citing them in papers, presentations, and lab reports. In-class workshops or sessions offered alongside the target classes should be requested and booked in advance of each semester's offerings, and requests can be submitted at https://classrequests.library.yorku.ca/

This knowledge, relayed in foundation courses, frees up instructors in the upper years to integrate more sophisticated Information literacy (IL) instruction into their courses and assignments such as:

- Issues around Copyright
- Open Access publishing
- Data visualization and mapping
- Systematic/Scoping/Rapid Review methodology
- Critical appraisal
- And more…

The following are descriptions of additional programming that is provided by the various departments of York University Libraries:

**Digital Scholarship Centre and Specialized Programming**

To discuss curriculum integration in the areas of digital scholarship, digital cultures and pedagogy, data management, open education, or scholarly publishing, YUL welcomes faculty to contact the Digital Scholarship Centre. The Digital Scholarship Centre (DSC) at York University Libraries houses knowledge in a range of digital tools and methods for web crawling and scraping, data cleaning, data curation, text processing and analytics, social graph analysis, data visualization, and linked open data applications,

with an emphasis on sustainable, low-barrier approaches, and open-source tools. The Digital Scholarship Centre draws expertise from a variety of departments within York University Libraries. The Digital Scholarship Infrastructure (DSI) supports students and faculty seeking assistance with open repositories, research project design, eLearning, and Open Educational Resources. The Open Scholarship department (OS) supports student and faculty needs around open access publishing, retaining author rights, improving research visibility, research data management, and adopting open science workflows. The department also hosts a data services team that can provide guidance on how to find and evaluate aggregated data and microdata sources for research projects as well as on how to document, publish, and preserve research data objects.

**Immersive Spaces at Markham Centre Campus Library**

The **Media Creation Spaces at MCCL** offer equitable access to library expertise and media creation spaces including audio and video recording equipment, audio-visual media creation spaces and editing suites, portable virtual reality headsets, and workstations for hands-on digital media production work. The Digital Scholarship Centre offers resources for faculty members seeking to integrate audio- and video-based assignments and activities into their courses and enables media literacy skills development in support of coursework and projects. In addition, it serves faculty needs for equipment and recording space as they are developing their own eLearning Open Educational Resource materials.

The **Makerspace at MCCL** is a site for critical making, offering a research and learning environment where students and researchers have access to 3D printers, electronic textiles, sewing machines, electronics, and robotics. This large space is configured as a teaching environment and can accommodate in-class learning. Library makerspace programming fosters key digital, social, and cross-disciplinary fluencies such as critical and creative thinking, research skills, project planning and management, professional communication, the ability to work in multidisciplinary teams, and adaptability to new contexts and circumstances.

The **Visualization Wall, Gaming Lab and Virtual Reality (VR) Lab** are in a single dynamic, configurable space, with the Visualization Wall augmenting VR and gaming experiences. The Visualization Wall, with a massive viewable area of 28 x 14 feet, allows for enhanced research and teaching applications such as the visualization of large data sets, engagement with sophisticated software platforms, and detailed viewing and modelling of complex structures. The gaming capabilities of the space are leveraged to factor in backwards compatibility for legacy equipment for instructors and allow multiple users to concurrently engage with the visualization wall in a variety of configurations. This infrastructure enables faculty to use VR as a teaching tool by narrating a student's VR experiences as projected on the visualization wall to a class of students. VR applications intensify connection to place and create an extraordinary opportunity to build empathy through lived experiences. Library programming includes introductory instruction in the creation of VR environments.

**Library Resources**

York University Libraries has adopted an "e-preferred" approach for the acquisition of content, meaning that any requests for new titles will be fulfilled with e-book purchases whenever they are available, and with as few access restrictions as publishers will allow. The Libraries also participates in consortia such as the Canadian Research Knowledge Network (CRKN) and the Ontario Council of University Libraries (OCUL) Scholars Portal, both of which provide access to a growing collection of electronic titles that can be discovered through our primary search interface, databases, and search engines such as Google Scholar.

Print materials relevant to the programs can be found through the Libraries' main Omni search interface at https://www.library.yorku.ca/. York community members can arrange to have materials held at any of our libraries. Aside from York's collection, our partnership with the Omni network provides students and faculty members access to print materials housed at any of our 14 partner institutions across Ontario.

**Interlibrary Loans (RACER)**
Interlibrary loan and document delivery options are available through RACER for any additional information needs that may come up. There is no limit to the number of articles that a student or faculty member may order through RACER per year, and these are delivered to the desktop, free of charge. Books can also be requested through this system free of charge. Registration and requesting is available from: http://www.library.yorku.ca/cms/resourcesharing/services-for-york-faculty-and-students/illrequestform/.
Apart from print books, York University Libraries hosts a large collection of government documents and microfilms, a wide range of audio-visual resources through the Sound and Moving Image Library.

**Open Content for Foundational Courses**
As part of its commitment to Open Access and Open Education, York University Libraries is placing increased emphasis on openly licensed and public domain materials for teaching and learning, including sources of open data. In addition, an increasingly wide range of Open Educational Resources (OER) are available through York University Libraries, and we have a guide to finding and evaluating these resources at https://researchguides.library.yorku.ca/OER.

The Libraries is pleased to provide support for members interested in creating OER for the benefit of the Foundational courses. Complementing our own Pressbooks publishing platform for open textbooks, we encourage faculty members to explore and use eCampusOntario's OER tools, including their Pressbooks platform and their H5P platform for creating open, interactive course content. Learn more about eCampusOntario's commitment to open education at: https://www.ecampusontario.ca/open-education-resources/.

**Relevant Databases, Indexes, and Data Sources**
Courses in the foundational year typically focus on introductory level topics and laboratory skills building in biology, chemistry, physics, and mathematics, while allowing students to explore various fields of interdisciplinary study.
The Libraries provide access to approximately 100,000 journals, 96% of which are e-journals. Scholarly, peer-reviewed articles can be searched in the Omni library catalogue or discovered through the Libraries' extensive list of subject-specific databases such as *Biological Abstracts (Clarivate), Web of Science (Clarivate), Scopus (Elsevier), SciFinder Scholar (ACS), arXiv E-Prints, Inspec* and *Compendex (both from Engineering Village), Medline (Ovid and PubMed), Embase (Ovid), MathSciNet (AMS and EBSCO)* and *Current Index to Statistics (IMS and ASA),* as well as a range of more domain-specific tools and platforms including all the *NCBI Bioinformatics databases* which are publicly available through the NCBI interface.

The Libraries' extensive set of subject-specific databases provide controlled vocabularies, operators, advanced search tools, limits and special filters to enable focused searching for specific topics.

**Program-Related Research Guides**

York University Libraries publishes research guides related to disciplines and topics addressed by York programs. Existing guides of interest to this program are:

Biology http://researchguides.library.yorku.ca/Biology
Biochemistry https://researchguides.library.yorku.ca/biochemistry
Chemistry https://researchguides.library.yorku.ca/chemistry
Physics https://researchguides.library.yorku.ca/physics
Mathematics and Statistics
https://researchguides.library.yorku.ca/c.php?g=679408&p=4792454

**Email, Chat, and Consultation Services**

In-person assistance with research, citation and other information is readily available from York University Libraries. Currently, online support is available through text messaging, email or through our online chat or drop-in zoom service. Chat and reference support services are accessible every day, with some reduced availability in the quieter Spring and Summer terms. Post-pandemic, librarians and staff will be available onsite at all branches, to provide tailored support for students as they need it.

**Conclusion**

York University Libraries is well positioned to support the curriculum and research needs of students and faculty in the proposed *Faculty of Science Biology, Chemistry, Mathematics, and Physics First-Year Foundational Program* offered through the Markham Centre Campus Library at York University. Our external partnerships and collaborative collection building initiatives with other universities have positioned YUL to well support the emerging needs of this program and to ensure the students and faculty are well supported in the ever-changing and complex scholarly communications landscape.

**Note: Course Descriptions, Curriculum Maps, and Program Learning Outcomes Maps not included but available upon request.**

## Major Modifications to Existing Programs
## Proposal Template

### Major Modifications Proposal

1. **Faculty:** Lassonde School of Engineering
2. **Department:** Electrical Engineering and Computer Science
3. **Program:** Bachelor of Applied Science (BASc) in Computer Science for Software Development
4. **Degree Designation:**
    i. BASc (Honours) Computer Science for Software Development
    ii. BASc Computer Science for Software Development
5. **Type of Modification:** Addition of a Computer Science major at the Markham Centre Campus
6. **Location:** Markham Centre Campus
7. **Effective Date:** Fall 2023

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8. **Provide a general description of the proposed changes to the program.**

    This proposal is for the addition of a new major in Computer Science for Software Development under the Bachelor of Applied Science (BASc) degree framework, with both regular and honours streams to be offered in Fall 2023 at the Markham Centre Campus. This major has related program learning outcomes to the existing majors already offered at the Keele Campus, namely the Bachelor of Science (BSc) regular and honours streams in Computer Science. The programs focus on software development and give students options to specialize in areas such as Cloud Computing, Cybersecurity, and Data Science. Several experimental and innovative ideas have been in the centre of the curricula design of these programs, such as:

    - splitting some courses to smaller units—including digital badges—to provide students with more choices and flexibility,
    - integrating some introductory computing courses with topics from natural science or other disciplines—with a team-taught approach—to motivate students by application of computer science to other disciplines,
    - using the flipped classroom mode and hybrid delivery in all core courses—to promote self-directed learning,

- including industry- and community- inspired projects in most core courses—to promote experiential learning, and

- interlacing complementary skills in the learning outcomes of most courses—to train well-rounded digital citizens.

**9. Provide the rationale for the proposed changes.**

Markham is a growing hub for high-tech start-ups and multinational industry players that employ software developers. There is unprecedented student and employer demand for Computer Science programs already within York University and across Ontario. For example, applications to York's Computer Science program have risen by nearly 40% over the last 3 years, ahead of the North American trend of 3–4% increase per year shown by the CRA's Taulbee Survey. Their emphasis on learning by doing and professional skills also set them apart from their competitors.

The federal government's Employment and Social Development Agency opened up the Global Talent Stream (Category B) to provide visas to foreign workers in highly skilled occupations that have been determined to be in-demand and for which there is insufficient domestic labour supply. Of the 12 occupations on the list in May 2021, the majority are related to computer science, including software designers, computer programmers, web developers, computer systems managers and database analysts.

**10. Comment on the alignment between the program changes with Faculty and/or University academic plans.**

In York University's Strategic Mandate Agreement 3 (SMA3), there is discussion of the metric institutional strength and focus, where five distinct clusters of programs are identified with the likelihood to be growing in demand. These include computer and information sciences and support services. Further, SMA 3 includes a metric for experiential learning and has the highest weighting at 17% for 2022-2023. In the proposed programs, students will spend a significant amount of time immersed in experiential learning activities, such as labs, tutorials, and capstone projects. By integrating the discipline's body of knowledge with Software Development, capstone projects, entrepreneurship, and technology transfer skills, the proposed programs offer a unique approach to Computer Science and align with York's commitment to build capacity to support more start-up ventures in the Markham region. The programs are expected to also have a positive impact on other metrics such as skills and competencies, graduate employment rate in a related field, and graduate employment earnings.[1]

Permeating all six priorities of the University's Academic Plan (UAP), "is a theme of coming together as both a precondition and an outcome of fulfilling the plan. A better future must be rooted in strong relationships – among the members of our own institution, across our multiple campuses, with our closest neighbours and Indigenous communities, and with our burgeoning networks of partners near and far." The proposed programs connect with the Markham community, other programs at the Markham Centre Campus (MCC), and the Computer Science programs at the Keele Campus. The programs are expected to contribute to at least four of the six priorities

of the UAP namely, 21st Century Learning: Diversifying Whom, What, and How We Teach; Knowledge for the Future: From Creation to Application; From Access to Success: Next Generation Student Supports; and Working in Partnership.

The World Economic Forum's "Future of Job Report 2018"[2] states that Software Development will be increasingly in demand in all sectors of the economy. Many other publications including, for example, Indeed's "Career Guide"[3] and ToughNickel's "Best Jobs for the Future"[4] mention Software Development and more broadly the field of Computer Science.

[1] https://www150.statcan.gc.ca/n1/pub/81-595-m/81-595-m2020002-eng.htm

[2] http://www3.weforum.org/docs/WEF_Future_of_Jobs_2018.pdf

[3] https://www.indeed.com/career-advice/finding-a-job/majors-in-demand

[4] https://toughnickel.com/finding-job/Best-Jobs-of-the-Future-2050

**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).**

This proposal is for the addition of two new majors: BASc (Honours) in Computer Science for Software Development and BASc in Computer Science for Software Development. The current programs are standard in the field of Computer Science, whereas the proposed program will reflect the focus on software development. The existing BSc in Computer Science offered at Keele Campus focuses on breadth of knowledge via science electives. The existing Bachelor of Arts (BA) in Computer Science offered at Keele Campus provides general knowledge from (non-)science via broad electives. The new BASc majors in Computer Science at MCC integrates applied computer science with a focus on software development courses. The BASc nomenclature is appropriate for the applied science programs here because it accurately describes the qualification and appeals to students and employers.

In Figure 1, below, we have provided an overview of how the Computer Science programs have been organized according to degree type at York University. The programs vary according to the required depth and breadth of understanding as required by the pan-university degree structures for the BA and BSc degree types. The BASc degree type simultaneously gives increased flexibility to attract a broader, diverse group of students through applied science.

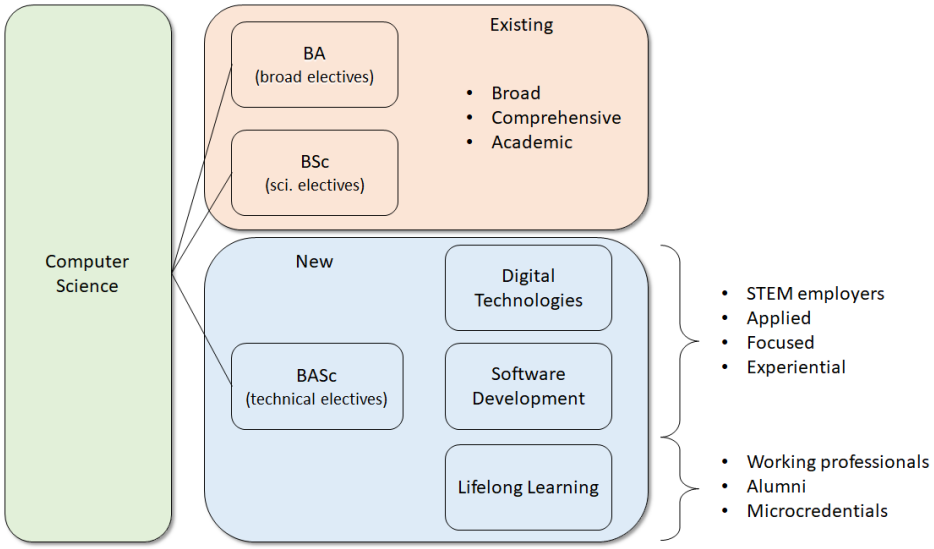


Figure 1. BASc—strategic addition of applied programs.

The delivery of the BASc in Computer Science for Software Development will be designed to align to the Ontario Council of Academic Vice-Presidents' University Undergraduate Degree Level Expectations (UUDLES), in addition to two Department-specific degree expectations (DLEs 7 and 8) as follows:

1. Depth and breadth of knowledge
2. Knowledge of methodologies
3. Application of knowledge
4. Communication skills
5. Awareness of limits of knowledge
6. Autonomy and professional capacity
7. Experiential Learning
8. Respect, Equity, Diversity, and Inclusion

The program learning outcomes (PLOs) are classified to three broad categories:

**Technical Understanding of Computer Science:** Gain knowledge of the theoretical and applied aspects of computing within technical domains.

PLO 1. Examine common themes and concepts in computer science and their broad applicability. (DLE1)

PLO 2. Analyze and experiment with the interplay between theory and practice in software development in community-inspired projects. (DLE5, DLE7)

PLO 3. Formulate solutions for problems related to systems and organizations while reconciling conflicting objectives and finding trade-offs. (DLE2, DLE3)

PLO 4. Integrate different aspects of software development in system design, the software development life cycle, and the interplay of multiple levels of detail and abstraction at the system level. (DLE2, DLE3)

**Global Citizenship:** Develop skills to be responsible, conscious global citizens.

PLO 5. Design solutions informed of privacy, ethical, social, legal, and economic responsibilities. (DLE6)

PLO 6. Describe the impact of computing on diverse individuals, organizations, and global society to exercise personal responsibility and decision-making. (DLE5, DLE6, DLE8)

**Professional Skills:** Demonstrate communication, interpersonal, and continued learning skills.

PLO 7. Communicate technical information with a variety of audiences. (DLE4, DLE8)

PLO 8. Practice effectively as part of a diverse team to develop and deliver quality software products. (DLE3, DLE4, DLE8)

PLO 9. Perform self-directed learning during developing a solid foundation that encourages the maintenance of relevant technical and complementary skills as the field evolves. (DLE1, DLE6, DLE7)

PLO 10. Demonstrate awareness of their strengths and limitations relative to their personal/professional goals and the demands of task-related objectives. (DLE6, DLE7)

The program consists of two main categories of courses: required and elective. The required category covers fundamentals and breadth of knowledge, such as core courses in the computer science discipline, general education, as well as background in math and other disciplines. The elective category provides students with opportunities to expand their skills and knowledge to any of the following areas or combination: technical courses, experiential learning (like co-op), as well as specialization in a certain concentration.

Unique experimental and innovative components:

- Combining basic programming topics and topics from natural science courses. The theory part of these courses will be team taught by instructors from computer science and natural science departments. The lab components will be computer programming/simulations.

  This idea could be expanded, in future, to integration of computer science and other disciplines such as art and environmental sciences.
- Almost all courses are planned to use flipped classrooms to allow for active learning experiences in class.
- Almost all courses are planned to be project-based, the project weight is about 25% in 1st year courses and will increase to up to 75% for most upper year courses and 100% for some.
- Communication and teamwork, as well as e-portfolio enhancement are the primary complementary skills that are developed in the program. These skills are addressed in two levels: one, there are courses in the program that exclusively

cover them; second, the syllabi of other courses interlace these skills with technical knowledge and skills that students learn in the course. Thus, principles of respect, equity, diversity, and inclusion are crafted into the program structure.

In addition, we expect those other pedagogies such as pathways based on microcredentials or block-taught courses will be included in the curriculum as the frameworks necessary for their implementation are developed by the Institution. For example, we anticipate that accelerated terms (equivalent to the current S1 and S2) will be available in all terms to support these flexible delivery methods.

The program learning outcomes are mapped to a set of required courses. Students will be assessed through the course learning outcomes for each course, and will include a combination of assignments, midterms, projects, final exams, and other assessment methods. Where the adoption of a particular course pedagogy is essential for the delivery of the program as a whole (e.g., project based and/or competency-based), these requirements will be clearly identified in the full course proposal and description for the information of both instructors and students. Course proposals are expected to be developed in accordance with new faculty hired to teach within both the Computer Science for Software Development and Digital Technology programs. See section 14 for more details about the planned faculty complement and resources. A preliminary description of courses and corresponding CLOs is provided in Appendix A.

**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.**

The proposal has been developed in consultation with the entire faculty of the Department of Electrical Engineering and Computer Science (EECS). During EECS departmental meetings in December 2019, February 2020, November 2020, and April 2021 the faculty members of the department discussed the proposal and approved its overarching principles. Issues about overlap and collaboration with the existing programs in EECS were discussed.

Other relevant meetings include the Dean's Office updates during Lassonde Faculty Council meetings in 2020 on January 10, February 7, March 6, September 11, October 2, November 6, and December 4. Additionally, the Office of the Vice-Provost Academic led a resource meeting on June 18, 2020, and a meeting took place with the Special Advisor for the Markham Centre Campus on November 19, 2020.

External collaboration has been front and centre at the monthly meetings of the EECS Markham Centre Campus committee, and this collaboration is considered one of the goals of the proposed programs. We are currently engaging with the Markham community to develop programs that maximize student experiential learning and foster ties to prospective co-op employers. We met remotely with the Markham industrial community on December 4, 2020, and discussions are ongoing.

Furthermore, EECS alumni and Markham employers have been surveyed and job market databases have been consulted. All contribute to the development of

programs that are based on the current trends in Computer Science for Software Development as well as lessons learned from the existing Computer Science programs at the Keele Campus.

**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.**

Fewer high school courses are required for this program than for the current BSc Computer Science program. This is the outcome of an intentional effort to minimise prerequisites throughout the new program to reduce barriers to participation. In particular, the reduction of high school requirements is designed to open admission to as many students as possible, recognizing that some grade 12 science courses are, regrettably, still a hindrance to some underrepresented groups in computer science. For example, only 15% of female students in grade 10 Science continue to grade 12 Physics and the fraction of women falls from 50% to 34%.[1]

The program admission requirements for Ontario secondary school students are as follows:

- 12U English (ENG4U)
- 12U Advanced Functions (MHF4U)
- 12U Biology (SBI4U) or 12U Chemistry (SCH4U) or 12U Physics (SPH4U)
- No prerequisite below 70%
- A second 12U Math course is recommended but not required.

**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.**

Almost all the faculty who will teach in the program will be newly recruited to York University. As described below, this complement will be sufficient to ensure an excellent program environment. The EECS Department is currently allocated 24 new faculty members at the Markham Centre Campus for the CSSD and Digital Technology programs. Approximately 50% of the new hires are expected to teach in the CSSD program. Colleagues in the two programs, as appropriate, will collaborate and cross-teach, so the following represent a notional allocation to the programs rather than a fixed demarcation.

The twelve faculty for this program will consist of a mixture of Teaching and Professorial Stream appointments to be determined. Three Teaching Stream faculty searches are currently underway specifically for Computer Science for Software Development. A preliminary hiring plan is given below, based on a 30:1 average student to faculty ratio for the entire program:

[1] http://www.onwie.ca/wp-content/uploads/2019/02/White-Paper-Final-Draft.pdf

| Ac. Year | Max. # students | Searches | Available faculty |
|---|---|---|---|
| FW 20-21 | | 1 | |
| FW 21-22 | - | 3 | 1 |
| FW 22-23 | - | 3 | 4 |
| FW 23-24 | 100 | 2 | 7 |
| FW 24-25 | 200 | 2 | 9 |
| FW 25-26 | 300 | 1 | 11 |
| FW 26-27 | 400 | ? | 12 |

The relative balance of teaching and professorial stream faculty members and their technical discipline will be adjusted as necessary as the program is rolled out to ensure the necessary teaching resources and relevant expertise.

Note that technical fields for the professorial appointments are also influenced by research priorities for the Markham Centre Campus.

For “out of the major” electives, common courses, and possibly some of the 4th year commercialization courses, resources from other programs present at the MCC will be required.

The program is not dependent on teaching resources from the Keele campus.

At present, this faculty complement is considered sufficient to staff the proposed program. In the future, it may be desirable to add more technical electives, streams, or certificates. Likewise, the appointment of research chairs or other clusters of scholarly activity would be highly beneficial for the academic environment.

For laboratory and support components, the Markham 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. There are four state-of-the-art computer labs for instruction for two MCC programs offered by EECS: the Computer Science for Software Development program and the Digital Technologies program. Two additional computer labs will support other computational instruction.

Teaching lab allocations for the CSSD program include:

- 30 seat + 48 seat general use computer labs (4th floor)
- 30 seat + 32 seat + 2 x 48 seat labs allocated to Lassonde (4th floor)
- 25, 35, and 50 seat active learning classrooms (5th floor)
- Server room for both teaching and research (6th floor)
- Two Maker Spaces, one in the Library and the other associated with Arts Media and Performance Design (AMPD)

The labs will include one state-of-the-art computer, complete with large monitor at each station. As the CSSD program is heavily project based, with several project showcasing per term, stations should be equipped with height adjustable and movable desks. Networking and technical support resources comparable to those already in existence at the Lassonde Building will be available for those labs. It is intended to allow two teaching lab sections to operate concurrently for any given

CSSD course, within close proximity so that the course director/instructor may attend to students in both labs almost as if the two physical lab spaces were one.

Also, twelve research spaces have been allocated to EECS. Although this is only half the number of EECS faculty projected for MCC, it will be adequate in the short term because laboratories will not be required by all researchers, nor by Teaching Stream faculty.

**15. When applicable, comment on the appropriateness of the revised mode(s) of delivery for the achievement of the program learning outcomes.**

At the new Markham Centre Campus, there are several ways in which experiential education will be integrated into the delivery of the programs. First, most courses are designed to be heavily experiential in nature not only by extensive lab components also by project-based learning and assessments. Second, there are several "Experience" courses that are meant to be completed via simulated workplace and/or work terms in the Markham community industrial or non-profit organizations. The Experience courses (including the ones in workplace) are all assessed by outcomes, some of which are based on finding connections between theory and practice. Further details of experience courses can be found in description of courses (Appendix A) and the prerequisite tree (Appendix B). Finally, attempts will be made to integrate the community in coursework, for example, using datasets or case studies supplied by local organizations, classroom visits, and invited guest lectures from the local community.

**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.**

The program delivery is planned to be primarily using flipped classrooms where pre-recorded lectures are provided in advance and the lecture time is used for discussion and Q/A. Most classes have interactive components in the form of scaffolded learning activities such as laboratories or tutorials that are delivered in person. These activities are designed to cover the technical skills as well as the professional skills and the global citizenship values among students. These skills and values are measured by course learning outcomes, similar to the assessment approaches in existing programs. Where appropriate, coupling of courses and cross-fertilization between disciplines is built into the curricula.

**17. Provide a summary of how students currently enrolled in the program will be accommodated.**

The faculty, technical and administrative support complement outlined above has been planned to fully support the academic activities envisioned for the program.

Currently, we plan to offer co-op to students in the program via Lassonde's co-op office. We note that this will increase students' time to completion. Co-op will also affect the flow-through during the program ramp-up (but not in steady state).

In addition, the program will offer a highly experiential learning environment throughout the curriculum both in labs, projects, etc. and with partner companies. Activities such as this will require support for building, maintaining, and managing relationships with those external partners. This is essential for continuity as instructors and partner team members change over time, and to accommodate growth in the program. Dedicated support will also help ensure a high-quality experience for our students.

Some of these functions can, and should, be carried out centrally for the Markham campus to facilitate and coordinate interactions with the partner organizations.

In order to fully integrate these experiential and WIL activities into the CSSD curriculum, however, it will also be necessary to have dedicated and specialized support staff at the local (program) level.

**18. Provide the following appendices:**

**A) 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.**

Appendix C includes proposed program requirements as they will appear in the Undergraduate Calendar.

**B) Program Learning Outcomes (eight to twelve)**

Appendix D includes proposed Program Learning Outcomes and mappings to DLEs, required courses, and PLOs of the existing Computer Science program.

## **Appendix B.** Prerequisite Trees.

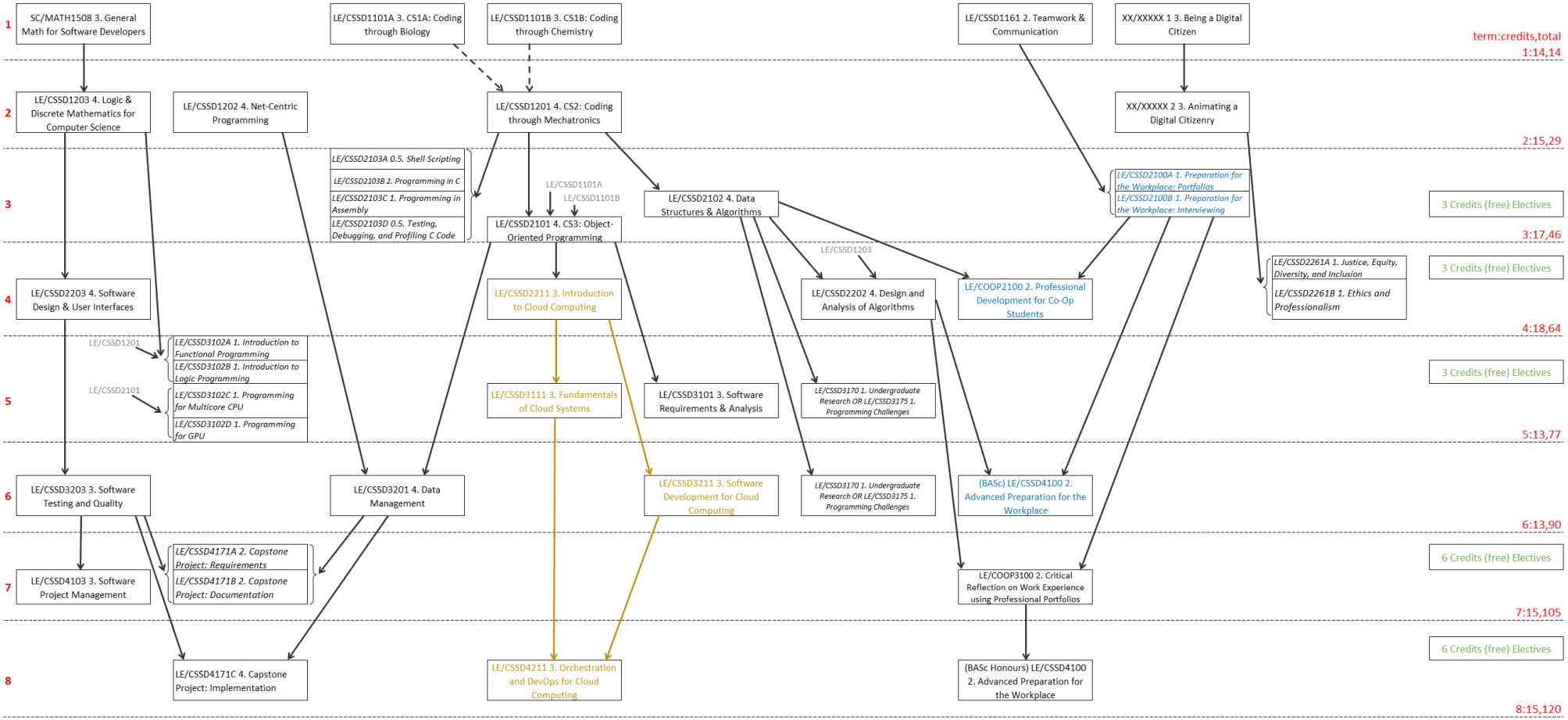


**Figure 1.** General Prerequisite tree for both BASc and BASC Honours with Co-op and Cloud Computing options.
Colour fonts for courses indicates they are optional or elective. Italic font indicates the courses are shorter than one term.

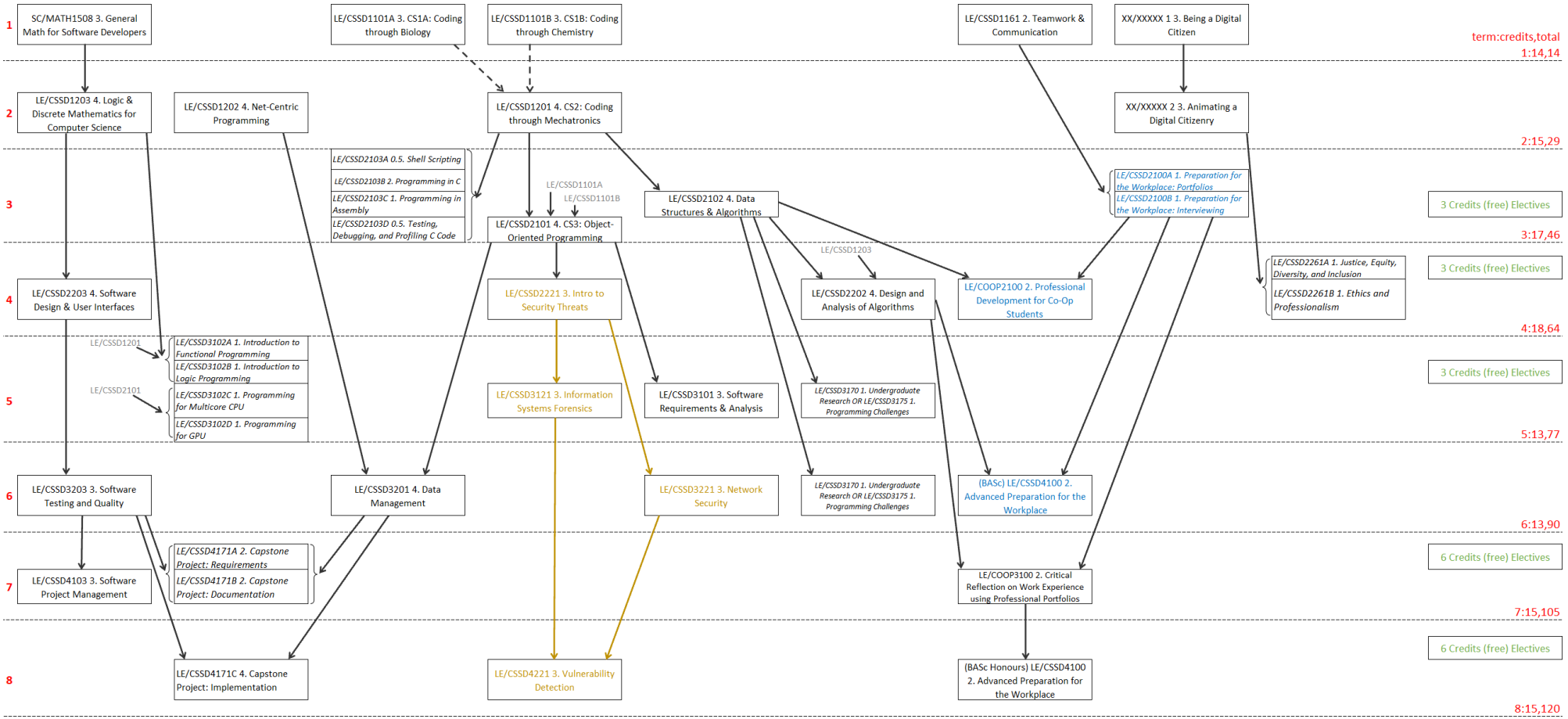


**Figure 2.** General Prerequisite tree for both BASc and BASC Honours with Co-op and Cybersecurity options.
Colour fonts for courses indicates they are optional or elective. Italic font indicates the courses are shorter than one term.

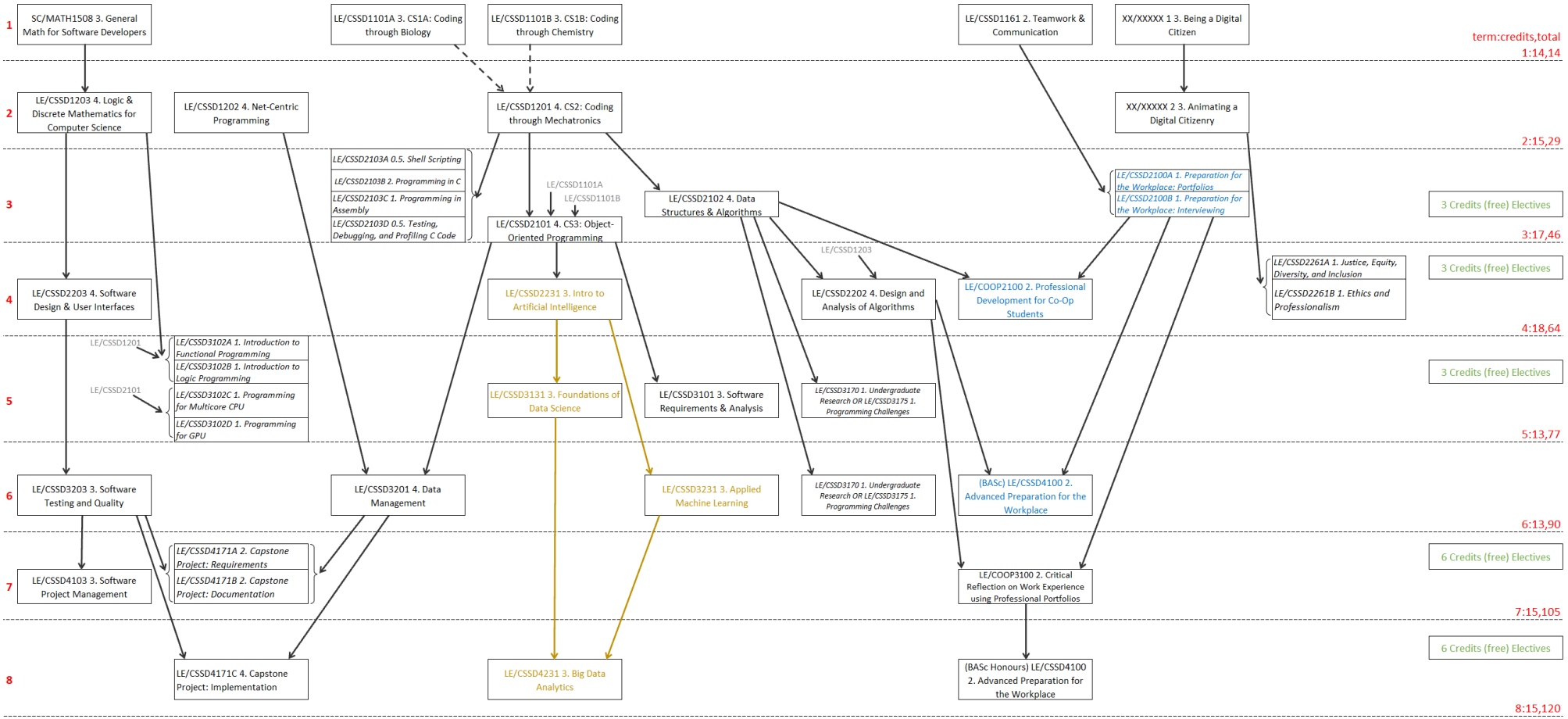


**Figure 3.** General Prerequisite tree for both BASc and BASC Honours with Co-op and Data Science options.
Colour fonts for courses indicates they are optional or elective. Italic font indicates the courses are shorter than one term.

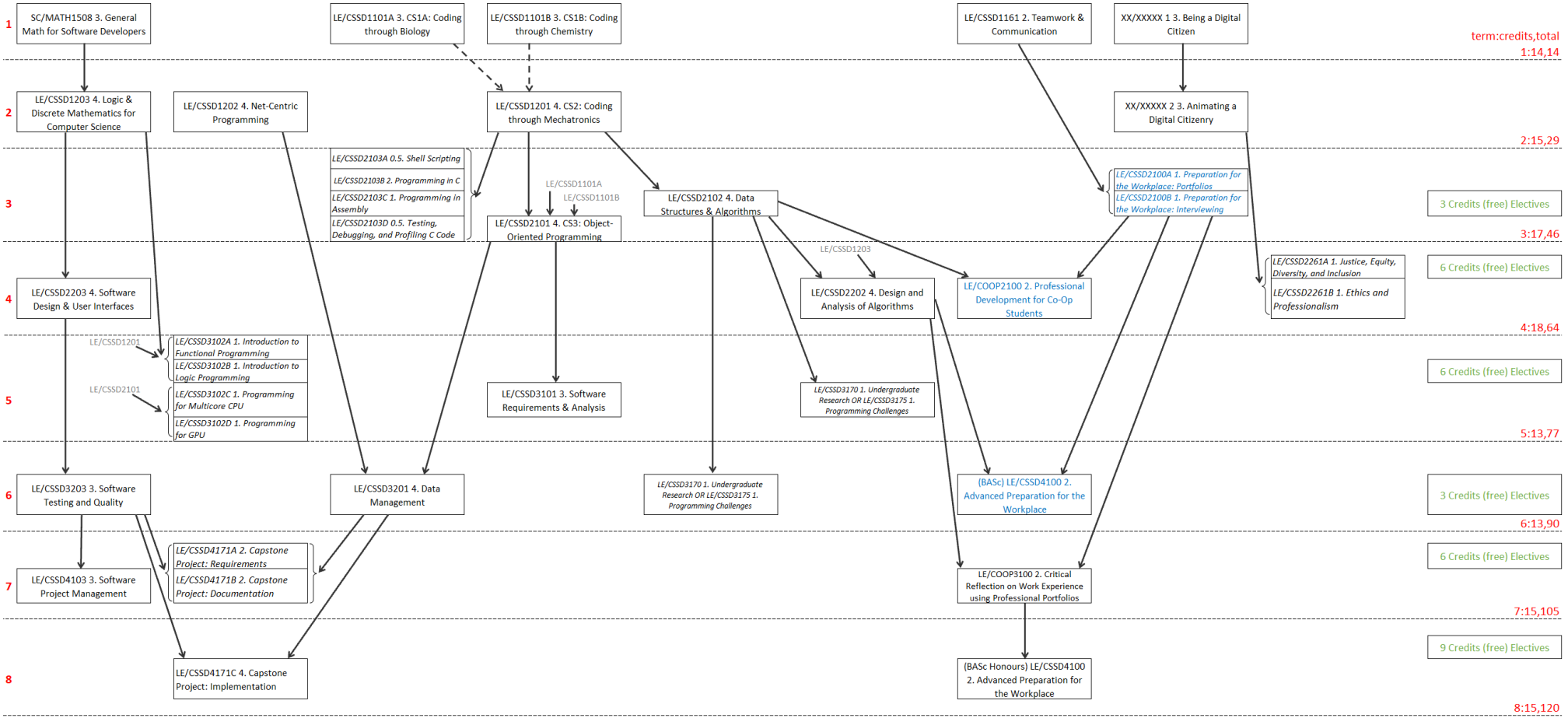


**Figure 4.** General Prerequisite tree for both BASc and BASC Honours with Co-op option and without any stream.
Colour fonts for courses indicates they are optional or elective. Italic font indicates the courses are shorter than one term.

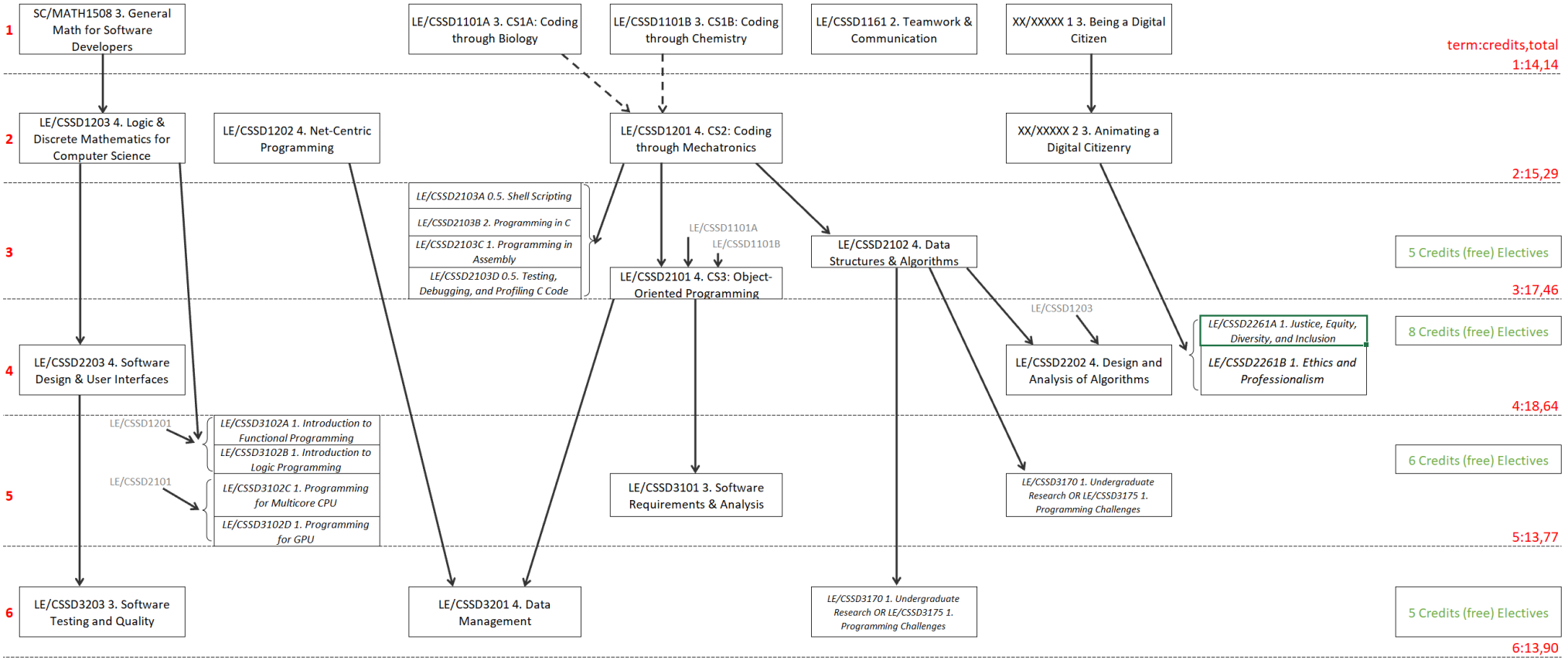


**Figure 5.** General Prerequisite tree for BASc without Co-op or stream options.
Colour fonts for courses indicates they are elective. Italic font indicates the courses are shorter than one term.

# Appendix C: Undergraduate Calendar Copy

## Bachelor of Applied Science (Honours) in Computer Science for Software Development (CSSD)

The Department of Electrical Engineering and Computer Science offers courses leading to a Bachelor of Applied Science (BASc) Honours degree in Computer Science for Software Development. It is also available as a 90-credit BASc degree. In the Honours program a co-op work placement is required. The technical focus of this program is on software development where students have the option of specializing in areas such as cloud computing, cybersecurity, and data science, as well as the work experience option. Students will have the opportunity to immerse in experiential learning activities, such as developing projects inspired by industry and community – online, on campus, or in community – coupled with the development of communication, and interpersonal skills. In addition to in-depth technical knowledge and skills, students will learn about privacy, ethics, law, and social and economic responsibilities and their application in computing.

### The Program Core

The core of the Computer Science for Software Development major is defined as:

*Table 1. Core courses (49 credits).*

| Code | Title |
|---|---|
| LE/CSSD 1101A 3.00 | CS1A: Coding through Biology |
| LE/CSSD 1101B 3.00 | CS1B: Coding through Chemistry |
| LE/CSSD 1201 4.00 | CS2: Coding through Mechatronics |
| LE/CSSD 1202 4.00 | Net Centric Programming |
| LE/CSSD 2101 4.00 | CS3: Object Oriented Programming |
| LE/CSSD 2102 4.00 | Data Structures & Algorithms |
| LE/CSSD 2103A 0.50 | Shell Scripting |
| LE/CSSD 2103B 2.00 | Programming in C |
| LE/CSSD 2103C 1.00 | Programming in Assembly |
| LE/CSSD 2103D 0.50 | Testing, Debugging, and Profiling C Code |
| LE/CSSD 2202 4.00 | Design and Analysis of Algorithms |
| LE/CSSD 2203 4.00 | Software Design & User Interfaces |
| LE/CSSD 3101 3.00 | Software Requirements & Analysis |
| Select 3 credits from the following: | |
| LE/CSSD 3102A 1.00 | Introduction to Functional Programming |
| LE/CSSD 3102B 1.00 | Introduction to Logic Programming |
| LE/CSSD 3102C 1.00 | Programming for Multicore CPU |
| LE/CSSD 3102D 1.00 | Programming for GPU |
| LE/CSSD 3203 3.00 | Software Testing and Quality |
| LE/CSSD 3201 4.00 | Data Management |
| Select 2 credits from the following showcasing credits: | |
| LE/CSSD3170 1.0 to 3174 1.0 | Undergraduate Research* |

| | |
|---|---|
| LE/CSSD3175 1.0 to 3179 1.0 | Programming Challenges* |

* The showcasing credits provide opportunities for students to select a programming project or an applied research problem for which they develop a solution under supervision of a faculty member. These courses emphasize experiential education and self-learning. Students can take up to five credits for showcasing.

## The Program General Education:

The required general education courses are defined as:

*Table 2. General Education Courses (17 credits)*

| Code | Title | Category |
|---|---|---|
| SC/MATH 1150 3.00 | General Mathematics for Software Development | Mathematics |
| LE/CSSD 1203 4.00 | Logic & Discrete Mathematics for Computer Science | |
| XX/XXXX XXX3 3.00 | Being a Digital Citizen | MCC General Education |
| XX/XXXX XXX4 3.00 | Animating a Digital Citizenry | |
| LE/CSSD 1161 2.00 | Teamwork & Communication | Profession |
| LE/CSSD 2261A 1.00 | Justice, Equity, Diversity, and Inclusion | |
| LE/CSSD 2261B 1.00 | Ethics and Professionalism | |

## The Program Other Courses:

Other courses in the program are defined as:

*Table 3. Other Courses.*

| Code | Title | Category |
|---|---|---|
| LE/CSSD 2100A 1.00 | Preparation for the Workplace: Portfolios | **Workplace** |
| LE/CSSD 2100B 1.00 | Preparation for the Workplace: Interviewing | |
| LE/COOP 2100 2.00 | Professional Development for Co-Op Students | |
| LE/COOP 3100 2.00 | Critical Reflection on Work Experience using Professional Portfolios | |
| LE/CSSD 4100 2.00 | Advanced Preparation for the Workplace | |
| LE/CSSD 2211 3.00 | Software Defined Environments | **Stream 1: Cloud Computing** |
| LE/CSSD 3111 3.00 | Fundamentals of Containers | |
| LE/CSSD 3211 3.00 | Software Development for Cloud Computing | |
| LE/CSSD 4211 3.00 | DevOps Toolchain | |
| LE/CSSD 2221 3.00 | Introduction to Security Threats | **Stream 2: Cyber Security** |
| LE/CSSD 3121 3.00 | Information Systems Forensics | |
| LE/CSSD 3221 3.00 | Network Security | |
| LE/CSSD 4221 3.00 | Vulnerability Detection | |
| LE/CSSD 2231 3.00 | Introduction to Artificial Intelligence | **Stream 3: Data Science** |
| LE/CSSD 3131 3.00 | Foundations of Data Science | |
| LE/CSSD 3231 3.00 | Applied Machine Learning | |
| LE/CSSD 4231 3.00 | Big Data Analytics | |
| LE/CSSD 4171A 2.00 | Capstone Project: Requirements | **Capstone** |
| LE/CSSD 4171B 2.00 | Capstone Project: Documentation | |
| LE/CSSD 4171C 4.00 | Capstone Project: Implementation | |

| | | |
|---|---|---|
| LE/CSSD 4103 3.00 | Software Project Management | **Miscellaneous** |
| LE/CSSD 3103A 2.00 | Principles of Computer Networks | |
| LE/CSSD 3103B 2.00 | Operating Systems Essentials | |
| LE/CSSD 1050 3.00 | CS0: Introduction to Computational Thinking | |

## BASc Honours in CSSD with Co-op (120 credits)

A. General education (17 credits) as specified in Table 2.
B. Major requirements
    - The program core (49 credits) as specified in Table 1
    - Capstone and project management (11 credits) as LE/CSSD 4171A 2.00; LE/CSSD 4171B 2.00; LE/CSSD 4171C 4.00; LE/CSSD 4103 3.00
C. Co-op courses & Work Term (6 credits) as LE/CSSD 2100A 1.00, LE/CSSD2100B 1.00, LE/COOP3100 2.00, LE/CSSD4100 2.00; LE/COOP 2109 0.00; LE/COOP 3109 0.00.
D. Elective courses (37 credits)
   Students can select these courses from outside the major or from additional courses in the major, such as an additional workplace course, from the stream courses, or up to 3 more credits from showcasing courses.
E. Upper-level requirements: a minimum of 36 credits at the 3000-level or higher overall.
F. Standing requirements: a minimum cumulative grade point average of 1.7 (in the 4.0-point scale) is required for the first 46 credits, and to graduate requires successful completion of all degree requirements and a minimum cumulative grade point average of 2.00 over all courses used to satisfy the degree requirements.

## BASc Honours in CSSD with Co-op and a Specialization (120 credits)

A. General education (17 credits) as specified in Table 2.
B. Major requirements
    - The program core (49 credits) as specified in Table 1
    - Capstone and project management (11 credits) as LE/CSSD 4171A 2.00; LE/CSSD 4171B 2.00; LE/CSSD 4171C 4.00; LE/CSSD 4103 3.00
C. Co-op courses & Work Term (6 credits) as LE/CSSD 2100A 1.00, LE/CSSD2100B 1.00, LE/COOP3100 2.00, LE/CSSD4100 2.00; LE/COOP 2109 0.00; LE/COOP 3109 0.00.
D. Stream courses (9 credits) from ONE of the following Streams:
    - Cloud Computing, select 9 credits from: LE/CSSD 2211 3.00; LE/CSSD 3111 3.00; LE/CSSD 3211 3.00; LE/CSSD 4211 3.00; or,
    - Cyber Security, select 9 credits from: LE/CSSD 2221 3.00; LE/CSSD 3121 3.00; LE/CSSD 3221 3.00; LE/CSSD 4221 3.00; or,
    - Data Science, select 9 credits from: LE/CSSD 2231 3.00; LE/CSSD 3131 3.00; LE/CSSD 3231 3.00; LE/CSSD 4231 3.00
E. Elective courses (28 credits)
   Students can select these courses from outside the major or from additional courses in the major, such as an additional workplace course, from the stream courses, or up to 3 more credits from showcasing courses.
F. Upper-level requirements: a minimum of 36 credits at the 3000-level or higher overall.
G. Standing requirements: a minimum cumulative grade point average of 1.7 (in the 4.0-point scale) is required for the first 46 credits, and to graduate requires successful completion of all

degree requirements and a minimum cumulative grade point average of 2.00 over all courses used to satisfy the degree requirements.

## BASc in CSSD (90 credits)

A. General education (17 credits) as specified in Table 2.
B. Major requirements: the program core (49 credits) as specified in Table 1.
C. Elective courses (24 credits)
   Students can select these courses from outside the major or from additional courses in the major, such as workplace courses, from the three streams, or up to 3 more credits from showcasing courses.
D. Upper-level requirements: a minimum of 18 credits at the 3000 level or higher including 12 credits in the major.
E. Standing requirements: a minimum cumulative grade point average of 1.7 (in the 4.0-point scale) is required for the first 46 credits, and to graduate requires successful completion of all degree requirements and a minimum cumulative grade point average of 2.00 over all courses used to satisfy the degree requirements.

LASSONDE SCHOOL OF ENGINEERING | YORK UNIVERSITÉ UNIVERSITY

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4700 Keele Street · Toronto · Canada · M3J 1P3

# MEMO

**TO:** Lyndon Martin, Vice-Provost Academic

**FROM:** Jane Goodyer, Dean, Lassonde School of Engineering

**CC:** Amir Chinaei, Assistant Professor, Project Lead for Work Integrated Learning Project, Lassonde School of Engineering
Richard Hornsey, Chair, Department of Electrical Engineering & Computer Science
Dan Palermo, Vice Dean, Lassonde School of Engineering
Alice Pitt, Senior Advisor, Markham Academic Strategic Planning

**SUBJECT:** Statement of Support for Bachelor of Applied Science in Computer Science for Software Development

**DATE:** November 1, 2021

I am pleased to express our continued support for the new Bachelor of Applied Science (BASc) in Computer Science for Software Development (CSSD) program that the Lassonde School of Engineering has planned to launch at the Markham Campus in fall of 2023. Similar to the BASc in Digital Technologies, the delivery of this program 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 CSSD program will differentiate itself from the Computer Science program offered at the Keele campus by focusing on teamwork experience, project-based learning, and experiential education through industry- and community-based projects. The CSSD program will provide increased accessibility to prospective students by explicitly removing pre-requisite high-school courses that are known to be barriers to post-secondary education.

In Lassonde, we are building a faculty complement plan with 24 dedicated faculty positions to complement the Department of Electrical Engineering and Computer Science (12 faculty members will be dedicated to each of the new program areas), which includes teaching stream and professorial stream faculty. We anticipate steady-state enrolments of ~400 students in each of our new Digital Technologies and Computer Science for Software Development programs proposed by this department for delivery at Markham. As both programs are highly complementary in their discipline's body of knowledge, these 24 faculty positions will be able to ensure these students have access to their expertise and the latest research. The faculty complement and enrolment plans for this program have been established within the context of a series of planning parameters that strikes the balance between academic standards and what the

School models for its programs, with the average student-to-faculty ratios aligning with comparable programs of similar size. The School has hired its first faculty member to support these new program initiatives, and is currently engaged in searches for 6 new hires for 2022-23 (3 professorial stream, 3 teaching stream).

Lassonde will participate in a suite of shared administrative supports that are planned for the delivery of all Lassonde programs to launch in fall 2023 at the Markham Campus. This will include dedicated supports for program delivery, work integrated learning, technical staff, operations and advising. Student supports will be provided via a combination of Lassonde staff, along with shared centralized Markham Campus student services staff. Libraries, information technology, counselling, career services, and more, will be available and provided for students through a shared-service delivery model similar to the structure that is provided on the Keele Campus.

YORK
UNIVERSITÉ
UNIVERSITY

**FACULTY OF SCIENCE**

**Office of the Dean**

**Michael Scheid**
Associate Dean Students

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TORONTO ON
CANADA M3J 1P3
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F 416 736 5950

sciadstu@yorku.ca
science.yorku.ca

November 1, 2021

Dr. Dan Palermo
Vice Dean, Lassonde School of Engineering
York University

Dear Dr. Palermo,

Re: Support for Bachelor of Applied Science (BASc) in Computer Science for Software Development

I have reviewed the Bachelor of Applied Science (BASc) in Computer Science for Software Development. I can confirm that we will have the necessary faculty complement in place at Markham Center Campus to provide teaching support for this program: MATH1508 3.0 – General Math for Software Developers; Co-teach CSSD1203 3.0 – Logic & Discrete Mathematics for Computer Science; Co-teach CSSD1101A 3.0 – Coding through Biology and CSSD1101B 3.0 – Coding through Chemistry.

We are excited to contribute to this innovative program and are looking forward to collaborating with Lassonde at Markham Campus.

Kindest regards,

Michael Scheid, Associate Dean, Students

YORK UNIVERSITY LIBRARIES

Office of the Dean

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www.library yorku.ca

# Memorandum

To: Prof. Amir H. Chinaei

From: Joy Kirchner, Dean of Libraries

Date: October 8, 2021

Subject: Bachelor of Applied Science (BASc) in Computer Science for Software Development Program Library Support

---

York University Libraries (YUL) is strongly positioned to support the curriculum needs of students and faculty in the proposed Bachelor of Applied Science (BASc) in Computer Science for Software Development program at York University's Markham Campus. As noted in the Statement of Library Support, YUL provides access to an extensive array of resources and services that support the academic and experiential engagement of students and faculty in this program. I draw your attention in particular to the new Markham Campus Centre Library (MCCL) spaces that will provide immersive, technology enhanced spaces that lends itself well to your program and the potential to partner with industry within these spaces. I also highlight YUL's curriculum integration offerings, digital literacy programs, data management expertise and specialized programming offered through our digital scholarship centre.

YUL's librarians and archivists regularly partner or consult with faculty on developing innovative programming and experiential learning opportunities drawing upon a wide variety of information sciences expertise that include repository management, online publishing, open science, data management and data visualization.

We look forward to contributing to the success of students and faculty in the Bachelor of Applied Science (BASc) in Computer Science for Software Development program at the Markham Campus of York University.

cc: Patti Ryan, Director, Content Development and Analysis,
Jack Leong, Associate Dean of Libraries, Research and Open Scholarship
Andrea Kosavic, Associate Dean of Libraries, Digital Engagement and Strategy

**BASc Computer Science for Software Development**
**Library Statement of Support**

**October 2021**

This statement of library support for the proposed BASc Computer Science for Software Development has been prepared in accordance with the guidelines outlined in the Quality Assurance Framework as set out by the Ontario Universities Council on Quality Assurance. It describes some of the services and levels of support that York University Libraries (YUL) will be able to provide to students and faculty at the Markham Centre Campus. YUL supports all programs through immersive spaces, diverse collections, instructional services, research assistance, access to knowledge resources, expertise with research dissemination and adaptive services.

This new BASc Computer Science for Software Development program provides academic and research opportunities in line with the Markham Campus' focus on technology, entrepreneurship, management and communications. York University Libraries embraces this approach with Markham Centre Campus Library (MCCL) programs and services that support multimodal learning through program-integrated offerings of technology, space and expertise. MCCL embeds library instruction and proficiency with immersive spaces including media capture and editing suites, a makerspace, VR capabilities, a gaming lab, and a visualization wall, all developed to support creative collaborations for teaching, learning, research and community partnerships. From a rich and diverse collection of print and electronic resources and tools, to one-on-one consultation services, instructional sessions, co-curricular offerings and group study spaces, the Libraries are well-positioned to support student success in what promises to be a rich, intensive program of study.

An overview of relevant York University Libraries services and resources for students and faculty is provided in subsequent sections.

**Library Curriculum Integration for BASc Computer Science for Software Development**

Information Literacy (IL) encompasses the skills to find, retrieve, evaluate, use and produce academic, professional and creative work. It enables students to participate fully in a university environment and a disciplinary culture. IL integration strengthens alignment with Degree Level Expectations and the seven defined categories of broad knowledge and skills integral to Ontario's Quality Assurance Framework.

Scaffolding IL instruction is most effective when organized at the program level as it eliminates duplication, improves assignment outcomes, and enables students to apply their learning. IL instruction spans many areas including digital methods, digital tools, data visualization, copyright, privacy and security. Based on ACRL's Framework for IL for Higher Education, and years of experience, we suggest integrating library instruction into the newly developed courses for the program, in particular in a

disciplinary introduction course, a software development methodologies course and a project or capstone course.

Instructors are encouraged to take advantage of dedicated, in-class sessions that can be tailored to course material or assignments. A wide range of programming is available, including digital and information literacy, blended learning modules, co-curricular programming, open educational resources and student seminars. Students in data science programs may benefit from dedicated, in-class workshops related to developing and implementing search strategies, tracking and correctly citing data sources, and managing collections of reference materials and citations. In-class sessions should be organized and booked in advance of each semester's offerings, and requests can be submitted at https://classrequests.library.yorku.ca/

**Digital Scholarship Centre and Specialized Programming**

To discuss curriculum integration in the areas of digital scholarship, digital cultures and pedagogy, data management, open education, or scholarly publishing, YUL welcomes faculty to contact the Digital Scholarship Centre. The Digital Scholarship Centre (DSC) at York University Libraries houses knowledge in a range of digital tools and methods for web crawling and scraping, data cleaning, data curation, text processing and analytics, social graph analysis, data visualization, and linked open data applications, with an emphasis on sustainable, low-barrier approaches and open-source tools. The Digital Scholarship Centre draws expertise from a variety of departments within York University Libraries. The Digital Scholarship Infrastructure (DSI) supports students and faculty seeking assistance with digital scholarship and digital humanities projects, open repositories, digitization best practices, digital preservation, research project design, eLearning, and Open Educational Resources. The department also hosts a data services team that can provide guidance on how to find and evaluate aggregated data and microdata sources for research projects as well as on how to document, publish, and preserve research data objects.

**Immersive Spaces at Markham Centre Campus Library**

The **Media Creation Spaces at MCCL** offer equitable access to library expertise and media creation spaces including audio and video recording equipment, audio-visual media creation spaces and editing suites, portable virtual reality headsets, and workstations for hands-on digital media production work. The Digital Scholarship Centre offers resources for faculty members seeking to integrate audio- and video-based assignments and activities into their courses and enables media literacy skills development in support of coursework and capstone projects.

The **Makerspace at MCCL** is a site for critical making, offering a research and learning environment where students and researchers have access to 3D printers, electronic textiles, sewing machines, electronics and robotics. This large space is configured as a teaching environment and can accommodate in-class learning. Library makerspace programming fosters key digital, social, and cross-disciplinary fluencies such as critical and creative thinking, research skills, project planning and management,

professional communication, the ability to work in multidisciplinary teams, and adaptability to new contexts and circumstances.

The **Visualization Wall, Gaming Lab and Virtual Reality (VR) Lab** are in a single dynamic, configurable space, with the Visualization Wall augmenting VR and gaming experiences. The Visualization Wall, with a massive viewable area of 28 x 14 feet, allows for enhanced research and teaching applications such as the visualization of large data sets, engagement with sophisticated software platforms, and detailed viewing and modelling of complex structures. The gaming capabilities of the space are leveraged to factor in backwards compatibility for legacy equipment for instructors and allow multiple users to concurrently engage with the visualization wall in a variety of configurations.

**Library Resources**

York University Libraries have robust and multidisciplinary collections that are responsive to emerging curriculum and research needs. We have adopted an “e-preferred” approach for new content, meaning that any requests for new titles will be fulfilled with e-book purchases whenever available or affordable, and with as few access restrictions as publishers will allow.

Print materials relevant to the programs can also be found via OMNI, and York community members can arrange to have materials held at any of our libraries. Aside from York’s collection, our partnership with the OMNI network provides students and faculty members with access to print materials housed at any of our 14 partner institutions across Ontario.

**Relevant Databases, Indexes, and Data Sources**

Many of the courses in the program will focus on the field of software development, in particular cloud computing, cybersecurity and data science. To inform their work, students will require access to technical books and manuals, scholarly journal and conference articles, software standards among other types of documents. The breadth of the program spans many disciplines, all of which can be addressed with elements of the York University Libraries collections.

The Libraries provide access to hundreds of thousands of journals, the vast majority of which are accessible online. Articles are discoverable through the Omni library catalogue or through the Libraries' extensive set of article databases such as IEEE Xplore and The ACM Digital Library among others. Students in the BASc Computer Science for Software Development programs will also benefit from a range of more domain-specific tools and platforms including Access Engineering and INSPEC.

**Program-Related Research Guides**

York University Libraries publishes research guides related to disciplines and topics addressed by York programs. Librarians can also create customized research guides to help with individual courses or assignments, usually as part of an IL session as described above. Existing guides of interest to this program are:

Computer Science: https://researchguides.library.yorku.ca/cse

Last updated: 21/01/2020

Data and Statistics: https://researchguides.library.yorku.ca/data
Library Data Services: https://researchguides.library.yorku.ca/dataservices
Mathematics: https://researchguides.library.yorku.ca/sts
Digital Scholarship and Digital Humanities: https://researchguides.library.yorku.ca/dsdh

**Email, Chat, and Consultation Services**

In-person assistance with research, citation and other information is readily available from York University Libraries. Currently, online support is available through text messaging, email or through our online chat or drop-in zoom service. Students in this program may also take advantage of our consultation service, where individuals or groups meet with a librarian to discuss specific assignment- or research-related questions or any other topic. These consultations are available at regular hours throughout the week, and can be booked online at https://www.library.yorku.ca/web/ask-services/book-a-consultation-with-a-librarian/

**Conclusion**

York University Libraries is well positioned to support the curriculum and research needs of students and faculty in the proposed BASc Computer Science for Software Development program at York University. Our external partnerships and collaborative collection building initiatives with other universities have positioned YUL to support the emerging needs of the students and faculty of this program in the ever-changing and complex scholarly communications landscape. Our external partnerships and collaborative, multi-institutional collection building and the many programs and services mentioned above will contribute to the success of this new program in the years to come.

Last updated: 21/01/2020

# The Senate of York University – Minutes

**Meeting:** Thursday, 28 Octber 2021, 3:00 pm via Zoom

| | | | |
|---|---|---|---|
| M. Roy (Chair) | M. Giudice | A. McKenzie | C. van Daalen |
| C. Brushwood Rose (Vice-Chair) | J. Goodyer | JJ. McMurtry | Smith |
| P. Robichaud (Secretary) | S. Grace | B. Meisner | G. Vanstone |
| M. Adachi-Amitay | C. Graham | D. Mittal | A. Viens |
| N. Agrawal | J. Grant | M. Morrow | R. Wang |
| M. Annisette | R. Grinspun | K. Murray | S. Watson |
| L. Appel | M. Guzman | S. Militello | N. Waweru |
| J. Aryaan | M. Hamadeh | R. Nandan | M. Winfield |
| A. Asif | L. Hébert | N. Neill | S. Winton |
| G. Audette | E. Hessels | P. Nguyen | P. Wood |
| P. Aulakh | R. Hornsey | A. Norwood | R. Zacharias |
| A. Badruddin | M. Hosale | R. Ophir | G. Zhu |
| T. Baumgartner | A. Hovorka | K. Ozowe | |
| A. Belcastro | B. Hu | D. Palermo | |
| D. Berbecel | U. Idemudia | P. Park | |
| R. Bhatla | P. Kohler | V. Pavri | |
| K. Bird | M. Karakul | L. Philipps | |
| N. Blake | S. Karimi | P. Phillips | |
| M. Bloom | A. Kimakova | W. Pietro | |
| M. Bunch | J. Kirchner | M. Poon | |
| D. Cabianca | T. Knight | C. Popovic | |
| N. Canefe | P. Kohler | S. Premji | |
| T. Choi | L. Korrick | A. Pyée | |
| J. Clark | A. Kraljević | P. Rahimpoor-Marnani | |
| E. Clements | K. Krasny | S. Rehaag | |
| J. Conder | P. Lakin-Thomas | M. Reisenleitner | |
| J. Connolly | M. Lambert Drache | S. Rosenbaum | |
| S. Cote-Meek | G. Langlois | R. Savage | |
| C. Da Silva | H. Larochelle | T. Shanahan | |
| S. Day | M F. Latchford | P. Singh | |
| M. Dodman | J. Lazenby | L. Sloniowski | |
| S. Ehrlich | N. Lemish | B. Spotton Visano | |
| M. Elghobashy | R. Lenton | K. Tasa | |
| S. Embleton | S. Liaskos | T. Theophanidis | |
| S. Ehrlich | K. Lo | M. Thomas | |
| J. Etcheverry | T. Loebel | K. Thomson | |
| D. Fernandez | A. Macpherson | T. Torry | |
| M. Fiola | J. Marchessault | G. Tourlakis | |
| L. Fromowitz | L. Martin | D. Triki | |
| D. Gelb | D. Matten | P. Tsaparis | |
| | C. McAulay | R. Tsushima | |
| | P. McDonald | I. Uwanyiligira | |

# The Senate of York University – Minutes

## 1. Chair's Remarks

The Chair, Professor Mario Roy of Glendon College, welcomed Senators to the meeting.

## 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 the Council of Ontario Universities

Speaking to the written report included in the agenda, the Academic Colleague to the COU, Senator Spotton Visano, reported on its August meetings in which members engaged in a discussion on COU's priorities for 2021-2022 and received several sector-wide updates, including an update on the recent work of the Financial Sustainability & Competition working group. The Academic Colleagues also received updates on the Ontario Health Data Platform (OHDP) and the status of COU discussions regarding micro-credentials.

## 4. President's Items

President Lenton reported on the following items:

- acknowledgement of the following recent appointments: Dr. Detlev Zwick, Dean of the Schulich School of Business, Dr. Gordon Binsted, Deputy Provost of Markham Campus, Adjunct Professor Joseph Mapa, Krembil Chair in Health Management and Leadership, and Dr. Susan Dion, Associate Vice-President Indigenous Initiatives
- highlights from the President's 2020-2021 Annual Report, Righting the Future, which documents the impressive progress made by the York community to advance priorities and goals articulated in the University Academic Plan (UAP) over the past year despite the challenges of the pandemic
- continued prioritization of the health and safety of the community and acknowledgement that the University will continue to follow the advice of health and safety officials throughout the planned full return to on-campus academic activities for the winter 2022 term.
- recent progress made on key projects underway at the Markham, Keele, and Glendon campuses

- recent progress on equity, diversity, and inclusion initiatives across the University, including the finalization of the Action Plan on Black Inclusion and the third-party review of the culture in York's Athletics and Recreation varsity teams
- recent progress on the University's work to develop a Campus Vision and Strategy for the future of the Keele campus edge lands
- the Kudos report, highlighting York's UNESCO Chair, Charles Hopkins, who is the recipient of the Clean50 Lifetime Achievement Award for his work to reorient education towards sustainable development

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. Information Items

The Executive Committee's information items included the following:

- its ongoing monitoring of the impact of the COVID-19 pandemic on academic activities, with actions pertaining to the disruption outlined in its written Report
- its approval of Senate Committee members nominated by Faculty Councils
- its confirmation of 2021-2022 priorities, with a key focus on enhancing collegial governance and fostering positive, productive processes
- its review of Senate committee priorities for 2021-2022
- the consolidated report on actions taken by Senate in 2020-2021
- an update on its membership for 2021-2022

### 6. Academic Policy, Planning and Research (APPRC)

APPRC reported on the following items:

- its confirmation of 2021-2022 priorities, with a key focus on advancing discussion on the future of pedagogy at the University
- its monthly report to Senate on Markham Centre Campus planning
- its receipt of a comprehensive briefing on the context and environment for the University's budget
- an update on its membership for 2021-2022

**7. Academic Standards, Curriculum and Pedagogy (ASCP)**

a. Extension of Duolingo English language placement test for admission to undergraduate and graduate programs, FW'22 – SU'24 academic sessions

It was moved, seconded and carried**, "that Senate approve the extension of the use of Duolingo as an accepted English language placement test and 115 as the minimum score for admission to York University for the academic sessions between FW2022–SU2024 as set out in Appendix A."**

b. Information Items

ASCP reported on the following items:

- its confirmation of 2021-2022 priorities, with a key focus on the proposals for Markham Centre Campus curricular programming and the establishment of the new Academic Conduct Policy
- its initial review of proposals for curricular programming at the Markham Campus
- an update on its membership for 2021-2022
- its approval of minor modifications to curriculum

***Glendon***

Minor changes to the Degree Requirements for the BA program in Economics

**8. Other Business**

There being no further business it was moved, seconded, and carried **"that Senate adjourn."**

## Consent Agenda Items

**9. Minutes of the Meeting of 23 September 2021**

The minutes of 23 September 2021 were approved on consent.

**10. Senators on the Board of Governors re: 12 October 2021 Meeting of the Board**

A synopsis of the Board meeting of October 12, 2021 as conveyed by Senators Etcheverry and Hamadeh was noted.

Mario Roy, Chair _____

Pascal Robichaud, Secretary _____