



## ACADEMIC COUNCIL REPORT

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### ACTION REQUESTED:

Recommendation	<input type="checkbox"/>
Decision	<input checked="" type="checkbox"/>
Discussion/Direction	<input type="checkbox"/>
Information	<input type="checkbox"/>

**DATE: 26 November 2019**

**FROM: Undergraduate Studies Committee**

**SUBJECT: New Program Proposal – Bachelor of Science (Honours) in Integrated Mathematics and Computer Science**

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### COMMITTEE MANDATE:

In accordance with Section 1. a) of the Undergraduate Studies Committee (USC) Terms of Reference, USC has the responsibility “to examine proposals for new undergraduate degree programs and major changes to existing programs and to recommend their approval, as appropriate, to the Academic Council”

### MOTION FOR CONSIDERATION:

That, pursuant to the recommendation of USC, Academic Council approve the Bachelor of Science (Honours) in Integrated Mathematics and Computer Science and recommend approval to the Board of Governors.

### BACKGROUND/CONTEXT & RATIONALE:

The proposed program will build upon the strengths of the existing Applied and Industrial Mathematics and Computer Science programs to provide an integrated curriculum aimed at developing enriched skills in mathematical analysis and modeling, and software design and programming. While the proposed program leverages the foundational courses of existing programs, as well as the discipline-specific expertise of associated faculty members, as an independent program Integrated Mathematics and Computer Science places less emphasis on computer hardware and exposure to the complete software stack of enterprise applications, as well as abstract mathematics. The proposed program focuses instead on where these two disciplines converge, as well as the practical application of computer knowledge and mathematical principles.

The program includes a series of program-specific upper-year “integration and application” courses in which the students will engage in experiential learning through self-directed group projects inspired by industry problems. This essential aspect of the program will ensure that students can integrate their mathematical and computer knowledge in a practical setting. The

program will include a Co-operative Education option, through which students may reinforce the career-oriented training they receive in their courses.

Aligned with Ontario Tech's mission, the proposed program is a response to growth and diversification of the technology industry. The experiential-learning components in the upper years of the program answers Ontario Tech's mission of promoting engagement, critical thinking and integrating experiences inside and outside the classroom. The program contributes to Ontario Tech's Strategic Mandate Agreement by linking with the designated Program Area of Expansion of Informatics/Data Science. It also aligns well in that it addresses a sectoral need for employees with a specific skill set. In addition to already existing experiential learning components in Mathematics and Computer Science, the proposed program introduces upper year "application and integration" project-based courses to further the experience of self-driven project-based learning.

Graduates of this program will be qualified for a variety of career paths within the technology industry. They will have the necessary knowledge and skills within each discipline to be competitive in obtaining jobs usually filled by single-discipline Computer Science or Math graduates, but will be particularly desirable candidates for the new class of employment that integrates the two fields. Graduates will also be able to pursue post-graduate education in a variety of Computer Science or Applied Mathematics areas. This program has been designed to allow its graduates to excel in this modern workplace.

#### **RESOURCES REQUIRED:**

As the proposed program draws on the existing expertise in Computer Science and Mathematics, in the Faculty of Science, no new faculty members are required for this program. The current courses offered in the program have the capacity to absorb the projected student enrollments. Marginal increases in various areas would be required to accommodate the increased enrolments, primarily in the Computer Science courses that include a lab component. The main impact to resource areas include teaching assistantships in the laboratories and tutorials, and increased administrative and faculty supervisory workload resulting from thesis supervisions.

To accommodate the increase in enrolment, additional lab tutorial/sections will be made available. The primary impact will be in the Computer Science courses, where an additional lab section will be required to accommodate an increase in the number of students. The Faculty currently has the teaching laboratory space to accommodate this increase in student enrolment, and no additional physical lab space is anticipated. There is sufficient capacity in the Mathematics courses, particularly in the upper years, to accommodate the additional 20 students per year. No significant increased resource requirements are anticipated in terms of library holdings, information technology support and student services.

Only limited additional financial resources will be required to support this program. The direct costs will be course assignments for IMCS 3010U and CSCMA 3020U, as well as additional TA time. The main financial needs will be the creation of the two new Integrated Applications courses, and additional lab and tutorial sections needed to accommodate the new students.

#### **CONSULTATION AND APPROVAL:**

Undergraduate Studies Committee Review and Recommendation: October 15<sup>th</sup>, 2019

Final Faculty Council Approval: October 1<sup>st</sup>, 2019

Undergraduate Curriculum Committee: September 27<sup>th</sup>, 2019

Program Development and Faculty Consultation: 2018-2019

#### **NEXT STEPS:**

- Pending the approval of Academic Council (AC), this proposal will proceed through the following approval steps:
  - Board of Governors
  - Ontario Universities Council on Quality Assurance
  - Ministry of Training, Colleges and Universities
- The expected date of implementation is the fall semester of 2021

**SUPPORTING REFERENCE MATERIALS:**

- New Program Proposal with Appendices
- External Reviewers Report and Response