UNIVERSITY OF WINDSOR
UNIVERSITY PROGRAM REVIEW (UPR)
REPORT ON: Computer Science
UNDERGRADUATE AND GRADUATE PROGRAMS
January 2021

EXECUTIVE SUMMARY

Review Preparation

In preparing this document, the Program Development Committee reviewed the following: Computer Science's Self-Study (SS) (March 2017/2018), the report of the external reviewers (ER) (May 2020), as well as the response from the Department Head (HR) (September 2020), and the response from the Dean (DR) (September 2020) to the above material. The external reviewers were: David Gerhard, Department of Computer Science, University of Regina; Joseph Sawada, School of Computer Science, University of Guelph; and Majid Ahmadi, Department of Mechanical, Automotive and Materials Engineering, University of Windsor.

Undergraduate and Graduate Programs

At the undergraduate level, the School offers a Bachelor of Computer Science (General), Bachelor of Computer Science (Honours), a BSc (Honours Applied Computing), BSc (Honours Computer Science with Software Engineering Specialization), and a BSc Honours in Computer Information Systems. In addition, a co-op option is available for the honours programs. Combined degrees offerings include: a concurrent Bachelor of Computer Science (Honours)/Bachelor of Education, a Bachelor of Mathematics (Honours Mathematics and Computer Science), and a Bachelor of Commerce (Honours Business Administration and Computer Science). Students also have the option of Combining their Honours Computer Science with a major from another discipline.

The School also offers a Certificate in Applied Information Technology (CAIT), a Minor in Computer Science, a Minor in Applied Information Technology, as well as a Major and Minor Concentrations for the Bachelor of Interdisciplinary Arts and Science.

The School of Computer Science offers a number of degree completion pathways and articulation agreements for College of Applied Arts and Technology (or equivalent) diploma holders, as well as degree completion pathways for university graduates. There is a Bachelor of Computer Science (General) for University Graduates, a BSc (Honours Applied Computing) for Univerity Graduates, a Bachelor of Computer Science (General) (for Qualifying Ontario and Other College Diploma Holders) and a Bachelor of Computer Science (Honours Applied Computing) (for Qualifying Ontario and Other College Diploma Holders).

At the Graduate level, the Department offers a Master of Applied Computing (MAC), a Master of Science in Computer Science, a Master in Computer Science with Artificial Intelligence Stream, and a PhD in Computer Science.

Enrolments

Undergraduate

	Fall 2016	Fall 2017	Fall 2018	Fall 2019	Fall 2020
Full-Time	384.5	456	524	646	671
Part-Time	101	107	136.5	121.5	207

Graduate

	Fall 2016	Fall 2017	Fall 2018	Fall 2019	Fall 2020
Full-Time	200	249	303	357	388
Part-Time	3	2	0	1	7

Human Resources

Faculty/Instructors

Tenure/tenure-track faculty	21 (including the Head) + 2 vacant positions
Sessional Lecturers/Limited-term appointments	4
Faculty members involved in graduate program delivery	21

Full/Part-Time Staff

Graduate Secretary	1
Head Secretary	1
MAC Program Secretary	1
Office Coordinator	1
Server and Network Technician	vacant
Systems Analyst	1
Systems Programmer	1
Technician	1
Undergraduate Program Secretary	0.7

FINAL ASSESSMENT REPORT (with Implementation Plan)

Significant Strengths of the Programs

The School is comprised of dedicated faculty and staff, committed to quality in teaching, research, and student support, as evidenced by teaching excellence awards, the large number of publications, and service awards. (ER, p.10, p.11; SS, p.180) Despite resource constraints, the School continues to meet the objective of its undergraduate and graduate programs which is "to produce highly qualified graduates to fill industry and government jobs in specialized areas in computing." (SS, p.180). To this end, the School developed alternative pathways to honours, general, and graduate degrees; providing greater access to students wishing to pursue a second credential and filling "industry needs for highly qualified computer science professionals". (ER, p.3) As noted by the External Reviewers, the School boasts a very high placement rate for its internship and co-op programs, as well as "a very high placement rate upon completion - which is inline with the industry demand." (ER, p.8, p.9; SS, p.180)

The External Reviewers commended the School on its commitment to align its undergraduate curriculum with the 2013 ACM curriculum document. The latter "is the basis for the accreditation of computer science departments in Canada" which the School was encouraged to pursue. (ER, p.4) (*See Recommendation 3*)

Opportunities for Program Improvement/Enhancements

While the External Reviewers noted the success of the School's undergraduate and graduate programs, they were concerned with the resource constraints and the impact on the continued quality of teaching, research, and student support. Although additional physical and human resources are needed, other options for program enhancements which would also assist in alleviating some faculty staffing needs include: 1) a review of its undergraduate programs with a view to streamline and right-sizing the curriculum, thereby reducing the number of courses offerings per year; and 2) strategic course planning. (DR, p.2,5,6)

The School also reported in its Self-Study that it "will be taking new steps in improving programs by introducing specialized streams at the graduate and undergraduate levels, particularly AI, Security and Data Computation." (SS, p.180)

These and other opportunities for program improvements are captured in the recommendations listed below.

IMPLEMENTATION PLAN

Recommendations (in priority order)
(Final recommendations arrived at by the Program Development Committee, following a review and assessment of the External Reviewers report, the response from the Department Head, and the Dean's response.)

Teaching, Learning, and Research

Recommendation 1: That the School submit learning outcomes and assessment methods for each of its undergraduate and graduate courses that clearly correspond to the University's stated "Characteristics of a University of Windsor Graduate"; as well as curriculum maps for each of its undergraduate and graduate programs submitted through the PDC approval process.
[Program LOs have been submitted for each of the School undergraduate and graduate programs. There remain several undergraduate and graduate courses for which learning outcomes have not been submitted through the approval process.]
Agents: School Council, Head, CTL
Completion by: Fall 2022

Recommendation 2: That the School of Computer Science bring its programs into closer alignment with the ACM recommendations followed by many other universities, for example, by making a course on professional practice mandatory in all of its undergraduate programs.
Agents: Head, School Council
Completion by: Fall 2022

Recommendation 3: That the School of Computer Science consider embarking on a process to become accredited by the Canadian Information Processing Society. Following the requirements of the Canadian Information Processing Society accreditation also would help the School streamline its curriculum and reduce teaching demands on the faculty.
Agents: Head, Dean
Completion by: Fall 2022

Recommendation 4: That the School of Computer Science add an Honours option to the Bachelor of Computer Science obtained via a degree completion pathway, providing students with the background required to continue their computer science education at the graduate level.
Agents: Head, Dean
Completion by: Fall 2022

Recommendation 5: That the School of Computer Science, working with the Faculty of Science and the Office of the Provost, develop a plan with metrics to get the computer science program back into the top 20 national rankings.
Agents: Head, Dean, Office of the Provost
Completion by: Fall 2024

Recommendation 6: That the School of Computer Science report on its plan to:
a. perform a peer review of teaching, at the faculty and sessional level, to improve the accountability of the large number of sections taught by sessional instruction;
b. create uniform policies and course syllabi templates to improve student satisfaction by eliminating and reducing inconsistencies in multi-section courses.

Agents: Head, faculty members, CTL, Peer Collaboration Network
Completion by: Fall 2022

Recommendation 7: That the School of Computer Science report on faculty members' efforts to take advantage of programs intended to increase grant success, including the Tri-Success Grant Program.
Agents: Head, faculty members
Completion by: Fall 2022

Recommendation 8: That the School of Computer Science, working with the Dean of Science and the Office of Strategic Enrolment Management, develop and report on a plan for the management of enrolment in the MSc and MAC programs, which should include:

a. a plan to follow up with MSc applicants who do not accept offers to determine the root reasons why those students are not choosing Windsor.
b. establishing and reporting on a set of metrics that can be used to ascertain a reasonable optimum size for the MAC program, to ensure that enrolment numbers do not hinder quality. Class sizes and student-to-instructor ratio are good metrics of quality, as well as high industry internship placement rates.
c. the exploration of creative solutions to internal student hiring, industry partnerships, student entrepreneurship, and internal cost-recovery business consulting model, to maintain a > 90% placement rate for MAC students.
d. clarification on the School's role in setting an optimal enrolment size for its programs.

Agents: Head, Dean, SEM Office, Office of Experiential Learning
Completion by: Fall 2024

Resources

Recommendation 9: That the School of Computer Science make a case to the Dean of Science and the space planning committee for more appropriate long-term consolidated space to house the School and bring the amount of allocated space in line with the current space needs.
Agents: Head, Dean, Space Planning Committee
Completion by: Fall 2024

Recommendation 10: That the School of Computer Science develop a hiring plan appropriate to the current and future context and then make a case to the Dean of Science, and the Provost or VP, Research and Innovation (as appropriate), for elements such as:

a. converting the part-time Undergrad Secretary role to full-time, especially given the recent growth in the number of incoming undergraduate students.
b. hiring an ancillary academic staff person (AAS) to coordinate undergraduate counselling and program advising.
c. hiring a full-time lab instructor(s) or lab coordinator(s), particularly for first year classes.
d. hiring tenure-track faculty in Computer Science or reduce enrolment in Computer Science to bring the undergraduate faculty to student ratio closer to the average at the University of Windsor, as well as the average in Computer Science departments across Canada.
e. obtaining a research chair to attract a new faculty member with a strong research profile.

Agents: Head, Dean, Provost, VPRI
Completion by: Fall 2024

Recommendation 11: That the School of Computer Science enter into discussions with Dean of Science and Office of the Provost to renew the funding agreement between the University and the School with respect to the MAC program.
Agents: Head, Dean, Office of the Provost
Completion by: Fall 2022

Recommendation 12: That the School of Computer Science publicize its high-quality publications, and directly provide objective evaluation metrics such as impact factor and number of citations, when making arguments for increased resources and applying for grants.
Agents: Head, faculty members
Completion by: Fall 2024

Recommendation 15: That the School of Computer Science seek to obtain more scholarships and/or bursaries for domestic and international Masters and PhD students through, for instance, advancement activities or funding from industry.
Agents: Head, Dean, Advancement Office
Completion by: Fall 2024

Governance

Recommendation 16: That the School of Computer Science simplify or reorganize the internal governance with respect to the committees.
Agents: Head, School Council
Completion by: Fall 2022