

**University of Windsor
Senate**

5.2.4: **Master of Science Degree in Computer Science with Co-operative Education– New Program Proposal**

Item for: **Approval**

Forwarded by: **Program Development Committee**

MOTION: That the Master of Science Degree in Computer Science with Co-operative Education program be approved.*

**Subject to approval of expenditures required.*

Rationale/Approvals:

- The proposed changes have been approved by the Department of Computer Science Council (AAU) (April 22, 2009), the Faculty of Science Coordinating Council (October 5, 2009), and the Faculty of Graduate Studies Council (October 20, 2009) and the Program Development Committee.
- The Centre for Career Education was consulted (April 8, 2009) and is supportive of this initiative.
- The outcome of the pilot Master of Computer Science co-op project (which was launched in the summer of 2008) indicated that Master's co-op students from the School of Computer Science are in high demand by employers.
- See attached.

PROGRAM DEVELOPMENT COMMITTEE NEW PROGRAM/MAJOR PROGRAM CHANGES FORM 2 (Co-op)

PART A: Basic Program Information

FACULTY:	Science
AAU:	School of Computer Science
Program Title:	M.Sc. in Computer Science with Co-op
Name of Program as it Will Appear on the Diploma (e.g., Bachelor of Arts Honours Psychology) [Please note that, for general degrees, the discipline is not included on diplomas.]	Master of Science Degree in Computer Science with Co-operative Education
Proposed Year of Offering [Fall 20xx]:	Winter 2010
Mode of Study:	Work Placement
Planned Student Enrolment:	60 (in Master's Program)
Planned Student Enrolment in the Co-op Component:	20 (in Co-op Option)
Normal Duration for Completion:	Two Work Terms for the Co-op Option, plus four semesters of course work

B. Overall Program Plan

Abstract/Summary of Proposal

Please provide a brief statement about the direction, relevance, and importance of the new or revised co-op program.

The proposed co-op option introduces an opportunity for Master's students in Computer Science to participate in co-op experience, while maintaining the program requirements of the existing Master's program. We expect students to gain practical knowledge of the state-of-the-art technologies of software development by working with software companies in Canada and abroad. The work experience will also help students develop standards of practice adhering to computing professional ethics. The School of Computer Science will work closely with students and ensure that the co-op education will achieve its goal of enhancing academic learning with valuable industrial experience.

Please provide a description of the knowledge and skills that students will be bringing to the workplace based on the curriculum.

Students eligible to participate in the proposed co-op education will have successfully completed at least one semester of full-time study at the Master's level in the School of Computer Science at the University of Windsor, which includes fulfilling the requirement of attending regular departmental seminars. When students start the co-op program, they will have comprehensive education in fundamental areas of Computer Science, gained skills in software programming and development, and exposed to theories in Computer Science as well as advanced tools and techniques currently used by industry.

Please provide a summary of the types of positions that would be suitable at each level of work-term.

Software analyst
Software designer
Software programmer
Software tester
Database programmer
Network programmer
Web designer
Application developer

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Academic Goal

What is the overall aim of the proposed new co-op program/program change? What will the new co-op program/program change accomplish?

The new co-op option will enable graduate students in Computer Science to gain hands-on experience by working on different aspects of computer software systems in actual work environments. We anticipate that the addition of co-op education will help achieve the goals of enhanced academic study, improved technical skills, and better career development.

- Academic study:
 - Integrate classroom theory with workplace practice, thus increasing academic motivation.
 - Develop greater understanding of academic and career goals with identified personal strengths, weaknesses, and preferences.
- Technical skills:
 - Develop the skills to write technical reports, and improve skills for effective communication.
 - Develop time management and organizational skills.
 - Improve technical skills based upon the nature of placement.
 - Gain experience working in groups both in the workplace and in the classroom for better understanding of individual roles of programmers within a team and the characteristics of group dynamics.
- Career development:
 - Develop critical workplace skills and employment readiness.
 - Develop a greater understanding of the workplace culture.
 - Create networks of contacts in a chosen career field, and maintain these networks as appropriate.
 - Develop an awareness of the importance of integrity with respect to professionalism, ethics, and written content.

Program Name and Degree Designation

Are the proposed program name and degree designation appropriate to program content and consistent with current usage in the discipline? Explain.

The program name "Master of Science Degree in Computer Science" identifies the field of study and specifies the level of degree. The degree modifier of "Co-operative Education" indicates that students completing the study have participated in co-op education.

RELATIONSHIP OF GOALS AND OBJECTIVES TO UNIVERSITY AND OTHER PRIORITIES

Area/Department's Goals and Objectives

How does the proposed new co-op program/program change fit with the area/department's overall goals and objectives?

The School of Computer Science has a very successful graduate program operating for almost 20 years. In recent years, the School has introduced different measures to maintain, improve, and enhance its graduate program. The proposed co-op option will help to accomplish the academic goals as outlined in the previous page of the form. In addition, it will help recruitment and retention by offering students the opportunities of additional financial support and industry experience, leading to increased enrolment. The co-op option is expected to play an important role in the School's short-term and long-term plans.

Faculty Five Year Plan

How does the proposed new co-op program/program change fit with the Faculty's overall goals and objectives as defined in its Five Year Plan?

The "Better and Bigger" five-year plan of the Faculty of Science identified five major goals. The proposed co-op option will provide direct support to the goals in research excellence with increased academic motivation, in graduate studies with an integration of classroom teaching and workplace practice, and in student recruitment with increased financial support and better career preparation. The improvements and enhancements of the graduate program in Computer Science will also provide support to the Faculty's goals in undergraduate

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education, especially at the senior level, with opportunities of involvement in an active atmosphere of study, and in the sense of pride and commitment with achievements and rewards.

University Strategic Plan

How does the proposed new co-op program/program change fit with the University's overall goals and objectives as defined in "To Greater Heights"?

The proposed co-op education follows the guidelines of "To Greater Heights" by working on the enhancement of graduate studies in the School. In particular, one of the strategies to implement "learning centred" education is Active and Collaborative Learning. Students learn more when involved in their education and motivated to think about what they are learning in different settings, including working in the industry. Collaborative problem-solving and mastering difficult material help to prepare students for the problems they will encounter daily during and after their graduate studies. Co-op education will enhance students' learning experience by offering industry experience through co-op placements and by gaining first-hand skills for problem solving.

DEMAND FOR THE NEW PROGRAM/PROGRAM CHANGE

Student and Market Demand

What tools and methodology were used to conduct the market assessment?

The School of Computer Science carried out a survey of the graduate students in the School, both informally at a meeting in March and formally with a questionnaire in September of 2008. The Centre for Career Education also had conducted a survey of local, provincial, and national companies in the summer of 2008.

Please provide quantitative evidence of student and market demand both within and outside the local region (e.g., responses/statistics from surveys, etc.).

All (100%) students participating in the student surveys indicated strong interest in the co-op option. Among the companies who responded to the industry survey, 62.5% indicated that they would be interested in hiring co-op students at the Master's level.

Please indicate the origin of student demand (% domestic and visa students). For graduate programs, also indicate the undergraduate or master's programs from which students would likely be drawn.

The number of Master's students enrolled in Computer Science has increased from 66 (37.9% domestic and 62.1% visa students) in Fall 2007 to 73 (47.9% domestic and 52.1% visa students) in Fall 2008. It is anticipated that domestic students will mainly come from Windsor and Southwestern Ontario with an undergraduate degree in Computer Science with Honours, or with an undergraduate degree in other disciplines (with Honours) and have sufficient education in Computer Science and experience in Computer Applications. Qualified graduates from relevant disciplines, such as Mathematics and Engineering, will form a potential pool of students for the program as well.

Estimated Enrolments

Provide details on projected enrolments in the following tables. NB: normally an annual intake of a minimum of 20 students is required for new co-op programs.

<i>Projected enrolment levels for the first 5 years of operation. (If the program is in operation, use actual and projected data.)</i>	Year 1	Year 2	Year 3	Year 4	Year 5
<i>In the Co-op Stream</i>	20	20	20	20	20
<i>In the non Co-op stream</i>	40	40	40	40	40

<i>Projected steady-state student enrolment per year:</i>	1 st Year	2 nd Year	3 rd Year	4 th Year
<i>In the Co-op Stream</i>	20	20	20	20
<i>In the non Co-op stream</i>	40	40	40	40

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	Year 1	Year 2	Year 3	Year 4	Year 5
<i>Projected number of international students enrolled in the co-op component.</i>	15	15	15	15	15

<i>Projected steady-state student enrolment overall:</i>	60 (total for co-op and non co-op)
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Note: The enrolment figures are for eligible Master's students in their first two years of study in the program. It is expected that students participating in the co-op option are going to take one or two semesters longer to complete their study due to the work terms spent on co-op placement.

Societal Need

<i>What tools and methodology were used to assess societal need?</i>
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Data collection was based upon employer support for the pilot co-op program launched in summer and fall 2008 for Master's students in Computer Science.

<i>Please provide information on the dimension of the societal need for graduates of the new co-op program/program change (e.g., socio-cultural, economic, scientific, or technological).</i>

The Centre for Career Education has serious concerns about the inability of the University to meet employer demand as there have been more requests than the number of students available for placement. This situation was caused by the reduced enrolment in Computer Science co-op programs at the undergraduate level, and it has reached a critical point that the University may lose partner employers if they start to solve their unmet staffing needs elsewhere. The introduction of the co-op option to the graduate program in Computer Science is going to generate a larger pool of co-op students to satisfy employer demand. For example, the following employers had requested to interview or hire a University of Windsor Computer Science co-op student but due to student availability we were unable to provide them with a student:

- Local Employers:
 - DataRealm Inc.
 - eSUNTech Canada
 - Windsor Mold
 - University of Windsor
 - Russell A. Farrow
 - Union Gas
 - Nova Chemical
 - Kieffer & Associates
- Employers outside of the Windsor Area:
 - Alcatel-Lucent
 - Environment Canada
 - Ministry of Transportation
 - SAP Canada
 - Hydro One Networks
 - Electronic Arts

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What is the geographic scope of the societal need for graduates of the new program/program change (e.g., local, regional, provincial, or national)? Provide evidence of the availability of an adequate number of positions of good quality both inside and outside the Windsor area (including names and contact information of potential employers, written statements or surveys from potential employers; and employer feedback concerning the hiring of graduates). Also see table below.

[NB: the majority of Ontario placements should qualify for the Co-op Education tax credit. See Policy on Co-op Programs for more details.]

- List of Companies Posting Jobs to Computer Science Students:
 - BC Hydro
 - Canadian Institute for Health Information
 - Canadian Tire Corporation Ltd.
 - Environment Canada
 - Essex Power Services Corporation
 - eSUNTech Canada
 - GE Consumer & Industrial - Lighting
 - Hydro One Networks Inc.
 - IBM (International Business Machines) Canada Ltd.
 - Nova Chemicals Ltd.
 - Ontario Power Generation
 - PMC-Sierra Inc.
 - RIM (Research In Motion)
 - Russell A. Farrow
 - Triumph
 - University of Windsor
 - Windsor Mold
- List of Companies Who Hired Master of Computer Science Students:
 - IBM
 - RIM
 - Windsor Mold

What is the potential for the eventual availability of international placements?

- The following companies have hired Computer Science Co-op Students:
 - ABB Switzerland
 - Adidas Germany
 - Heiler Software USA
 - Google USA

<i>Were comments/letters obtained from a variety of potential employers who have seen the curriculum and commented on the need for graduates within their organization and, more broadly, in their field of endeavour?</i>	☒ X Yes <i>[If yes, please append letters to this proposal.]</i>	☐ No <i>[If no, please provide an explanation below.]</i>
<i>Were comments/letters obtained from relevant professional societies and/or associations about the need for graduates based on a review of the curriculum?</i>	☐ Yes <i>[If yes, please append letters to this proposal.]</i>	☒ X No <i>[If no, please provide an explanation below.]</i>
<i>Were industry employment surveys reviewed for evidence of societal need (indicating numbers of positions in the field, numbers of new positions anticipated in the field, number of positions in the field current</i>	☐ Yes <i>[If yes, please append surveys to this proposal.]</i>	☒ X No <i>[If no, please provide an explanation below.]</i>

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<i>being advertised, etc.)?</i>		
Are there any statistics available on the number of Ontario students leaving the province to study in the same field elsewhere in Canada or abroad?	☐ Yes <i>[If yes, please append statistics to this proposal.]</i>	☒ No <i>[If no, please provide an explanation below.]</i>
Explanation: The pilot co-op program (for Fall 2008 and Winter 2009) was very successful at a 100% placement rate for actively competing students. Due to the wide application of computer systems, the proposed co-op education has an emphasis on providing training and skills applicable to different fields, rather than a particular profession.		

Please provide information on the anticipated duration of, and trends in, societal need for graduates of the new program/program change.

Seven Master's students were admitted to the pilot co-op program in the summer of 2008. They had 33 interviews in total in the first two weeks, and all had secured placements in the first two months. In the process, larger companies such as RIM and IBM were very aggressive in recruitment, with the result that smaller firms were frozen out of the process. In particular, IBM had interviews and made offers in the first week the students were available to be hired. In the fall of 2008, six additional students were admitted to the second phase of the pilot program. Throughout the competition, students were able to apply to 163 different positions. The average number of interviews granted was 5.3. The outcome of the pilot project is a clear indication that graduate students from the School of Computer Science are in high demand by employers.

List other similar programs being offered by other institutions in the Ontario university system. Resources to determine whether other similar programs are being offered in Ontario include www.electronicinfo.ca, www.electronicinfo.ca/einfo.php, and www.oraweb.aucc.ca/showdcu.html.

University of Waterloo, University of Ottawa, and Carleton University have similar co-op program at the Master's level.

Is the evidence of societal need and student demand for the proposed new co-op program/program change sufficient to justify duplication where there are programs in the system that are the same or similar? How does this initiative differ from similar programs in the system? What are its innovative and distinguishing features?

The positive outcome of the co-op pilot program indicates that our students are competitive and well prepared for the placement. Listed below is the feedback that the Centre for Career Education received from supervisors at the companies who hired our Master's students.

- Feedback from Company Supervisors:
 - Student has been doing great, eager to learn new things. Technical proficiency is very good and they love to learn.
 - Student has met expectations, enthusiastic, positive attitude, works well with people.
 - We've been quite happy with _____ on the team so far. He has more database programming experience than the typical co-op student and has allowed him to be engaged in work a lot quicker. Command of the English language is a bit of an issue, but he is working on this. He is always willing to help and continues to get more comfortable as his work term progresses
 - Actually it's a pleasant experience with the student. He helped with the developing of a small tool and participated in testing automation.
 - She is doing quite well and is working on complex assignments, working on coding ports. Is a quick learner, would like to see her participate more in meetings.
 - The student has been contributing to the team in a number of different ways; is able to work at a high level. A quick and independent worker is able to find information.
 - The placement is going very well, is a quick learner and has a positive outlook on work.
 - Had more expectations of the student when he was hired, average performance to date.

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RESOURCES

Please provide detailed information on the resources currently available, anticipated sources of new resources, reallocation of resources or cost-savings, and the additional resources required to run the proposed new program or program change. Incorporate new information or issues raised during or after the review of Form 1. [There is almost never a neutral resource impact of a proposal.]

Note: The attached Budget Summary Sheet must also be completed and submitted as part of the complete new program/program change proposal.

RESOURCES AVAILABLE

Faculty and Staff

What are the faculty and staff resources (including all faculty and staff from affected areas/departments) currently available and committed to actively support the initiative (e.g., administrative, teaching, supervision, etc.)?

The School of Computer Science has 23 faculty, two Ancillary Academic Staff (AAS) (Applied Computing Learning Specialists, term appointment for 2007-10), one Ancillary Academic Staff (Information Technology Learning Specialist, primary responsibility for courses in the Minor in Applied IT), six technical support staff, and four and half administrative support staff.

Provide an assessment of faculty expertise available and committed to actively support the new program.

All faculty members in the School of Computer Science have a Ph. D degree in Computer Science or a closely related discipline. All faculty members in the School have ongoing and funded research projects in computer related areas. They have been providing supervision not only to graduate students, but also to undergraduate Co-op projects including serving as advisors and evaluating work term assignments.

Other Resources

What are the resources currently available and committed to actively support the initiative (including library, teaching and learning support, space, equipment, facilities, GA/TAs, etc.)?

What are the resources to actively support the initiative?

Laboratory and Equipment:

The School of Computer Science has ten small-size research laboratories dedicated specially to graduate students. In addition, graduate students have access to four laboratories shared with undergraduate students. Each of the four "drop-in" labs contains approximately 30 desktop devices, being either a Multimedia PC or a Sun Ray thin client. These desktops are used to access a group of high-performance Sun Microsystems V880 servers. One server supports desktop applications, window systems, electronic mail and Web servers. A second V880 server has programming applications and development environments installed.

Approximately 100 more desktops are installed in faculty offices and research labs. The School also operates laser printers, color printers, scanners, digital cameras, data projectors, and digital video equipment (cameras, playback and capture devices) for use in various courses and research. Every graduate student has access to the Internet, electronic mail, file storage, and applications. Multiple Windows servers provide support for PC's in the School. Additional Sun servers, Apple Xserve and Windows servers complete the processor complement, providing secondary network application support and specialized application services.

The School operates a dedicated, state-of-the-art computer network and software-development environment. All networking has been upgraded to provide Gigabit Ethernet to each computer lab, research lab and faculty and staff office. Every office is equipped with at least two dedicated Fast Ethernet copper connections and two pairs of fiber cable. All switching is performed on Enterasys Carrier-Class Switch-Routers. Computer Science traffic is isolated from the rest of campus, ensuring high quality in service.

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What are the student support services currently available and committed to actively support the initiative?

The proposed co-op education will be supported by the Centre for Career Education. There are currently a total of five Co-op Coordinators with two Coordinators working with the Computer Science Co-op program. No additional resources would be required to support this new co-op program. The students will have access to a Program Co-op Coordinator to assist them with their professional development skills including resume writing, interview skills, time management, organizational skills, etc. Students will also work directly with an Employer Relations Co-op Coordinator who assists them in their job search for co-op placements and communication with employers.

Reliance on Resources from Another Area/Unit

Will the new program rely on existing resources of another campus unit (e.g., courses in the calendar, equipment or facilities outside the proposer's control or use of existing equipment within the proposer's control with maintenance and upgrading requirements specified)? Please elaborate and provide relevant details.

The Centre for Career Education will provide support for many elements of this co-op program, including but not limited to assisting students in their search for placements, managing relationship with employers, overseeing program details, supporting student learning outcomes, and monitoring placements. As the Centre is already supporting the existing Computer Science co-op programs at the undergraduate level, it is well-positioned to absorb the additional responsibilities. The Centre welcomes this program as the addition of graduate co-op students will help in accommodating strong employer demand.

ANTICIPATED SOURCES OF NEW RESOURCES

List all anticipated sources of new resources available from within the area/department or Faculty (external grants, donations, government grants, etc.)

None

REALLOCATION OF RESOURCES AND COST-SAVINGS

In reviewing the resources required to run the proposed program/program change, what opportunities for internal reallocation of resources and cost-savings have been identified and pursued by the area/department?

None

ADDITIONAL RESOURCES REQUIRED

Faculty

What additional faculty resources (including faculty resources required by all affected areas/departments) are required to run the proposed program?

No additional resources are needed by either the department or the Centre for Career Education to introduce the co-op option to the graduate program in Computer Science.

Staff

What additional staff resources (including staff resources required by all affected areas/departments) are required to run the proposed program?

None, as the existing staff will provide support within the School of Computer Science, and existing co-op coordinators for Computer Science in the Centre for Career Education will support the co-op aspect of this program.

GA/TAs

What additional GA/TA resources (including GA/TA resources required by all affected areas/departments) are required to run the proposed program?

None

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Library

What additional library resources (including library resources required by all affected areas/departments) are required to run the proposed program?

None

Teaching and Learning Support

What additional teaching and learning support resources (including teaching and learning support resources required by all affected areas/departments) are required to run the proposed program?

None, as students will remain in contact with their supervisors with respect to the preparation of term report while in work placement. Supervisors will evaluate reports when students come back from placement.

Student Support Services

What additional student support services are required to run the proposed program?

None

Space and Facilities

What additional space and facilities resources (including space and facilities resources required by all affected areas/departments) are required to run the proposed program?

None

Equipment

What additional equipment (including equipment resources required by all affected areas/departments) is required to run the proposed program?

None

Consistency with Five Year Plan

Are the resources requested consistent with the resources requested in, and the focus of, the area's Faculty Five Year Plan?

The proposed co-op education enhances the graduate program in Computer Science, without the need of additional resources. It supports the goals as identified in the five year plan

LEARNING OUTCOMES

Program Learning Outcomes <i>(see Appendix A for more on learning outcomes)</i> <u>At the end of this program, the successful student will know and be able to:</u>	Characteristics of a University of Windsor Graduate <u>A U of Windsor graduate will have the ability to demonstrate:</u>
▪ relate academic learning with practical application in a career-related setting ▪ identify the connection and distinction between academic study and industrial practice ▪ identify state-of-the-art technologies in computer application	A. the acquisition, application and integration of knowledge
▪ select techniques for projects under development ▪ evaluate the suitability and propose the selection of project-related techniques ▪ review and assess the applicability of project-related techniques	B. research skills, including the ability to define problems and access, retrieve and evaluate information (information literacy)

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Program Learning Outcomes <i>(see Appendix A for more on learning outcomes)</i> <u>At the end of this program, the successful student will know and be able to:</u>	Characteristics of a University of Windsor Graduate <u>A U of Windsor graduate will have the ability to demonstrate:</u>
▪ apply academic learning in industry projects ▪ recognize the practical nature of industrial applications, and examine technical and non-technical issues in projects ▪ propose solutions and assess results for technical problems encountered	C. critical thinking and problem-solving skills
▪ identify emerging techniques and new trends in industry practice through an awareness of information flow in the sector	D. literacy and numeracy skills
▪ review and interpret responsibility assignments for members in a team ▪ analyze the influence of individual members in team projects ▪ recognize the impact and contribution of developed products	E. responsible behaviour to self, others and society
▪ report to team manager and supervisor on a regular basis informally and in writing ▪ recognize and appraise contributions of team members in projects ▪ present the results and discuss findings in presentation	F. interpersonal and communications skills
▪ demonstrate capabilities of work under time and logistical constraints typical of industry-related projects ▪ report participation and practice in project planning, scheduling, and management	G. teamwork, and personal and group leadership skills
▪ distinguish the functionality and performance of software products ▪ identify and discuss the factors that influence productivity of software development and the quality of software systems	H. creativity and aesthetic appreciation
▪ recognize and appreciate the continuous need for new knowledge and skills in computer applications	I. the ability and desire for continuous learning

MONITORING AND EVALUATION

How will the success of the program be monitored and evaluated (include information to be gathered, method, criteria for evaluation, review process, and use of information to adjust activities/plan)?

The success of the program will be monitored in the following ways:

1. Number of students graduating from the program with co-op.
2. Number of students who will be successful in getting jobs in the industry as computer professionals.
3. Ratio of students vs. co-op job opportunities posted.
4. Number of students in the program who are successful in getting co-op positions.
5. Where student and employer placement surveys are conducted by the Centre for Career Education, the responses and data collected through them will be reviewed.
6. Appraisal of the program by graduate program Review Committee.

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AAU Council Approval of New/Revised Co-op Program

Please obtain signatures for the following statement.

Before a determination can be made regarding the feasibility of a co-op program, there must be a clear indication of support for the program from the AAU. Support implies that the area will provide ongoing departmental funding to establish a co-op faculty representative who will liaise with the Centre for Career Education in the operation of the program and that the area will ensure that an adequate number of faculty members in the AAU or program contribute to the co-operative education program by grading work-term reports, attending and evaluating work-term presentations, assisting in the job development process, establishing a departmental co-op committee as appropriate, etc. (see Policy on Co-op Programs, Summary of AAU/Faculty Member Involvement in a Co-operative Education Program, for more on the role of the AAU and faculty members). This commitment must be agreed to by the AAU Council at a meeting at which the development or modification of a co-op program was considered and approved.

*Signed agreement by the AAU Head, acting as chair of the AAU Council, that AAU members support the development of the co-op program.**

Signature of AAU Head*: Dr. A. K. Aggarwal

Signature of Director of the Centre for Career Education: Ms. Karen Benzinger

C. The Program Details

Admission Requirements

Please provide information on program specific admission requirements, selection criteria, arrangement for exemptions or special entry, credit transfer, etc.

Graduates of the University of Windsor or of other recognized Colleges or Universities may be admitted to programs leading to the Master's degree. A student with an Honours Bachelor's degree or equivalent with adequate specialization in Computer Science and with at least a B-level standing in the major subject may be admitted to a Master's degree program (II Master's Candidate) which requires a minimum of one year to complete. A student with an Honours Bachelor's degree in a related subject and with at least a B-level standing in the major subject may be admitted to a minimum two-year Master's program (II Master's Candidate or I Master's Qualifying followed by II Master's Candidate) depending upon prior qualifications.

A student in good standing may apply, as early as the end of his/her first semester, to pursue the co-op stream of the Master's degree, in consultation with his/her graduate advisor. Such applications will be reviewed and approved by the graduate coordinator.

Program Curriculum Structure/Program of Study

Total courses:

- Five courses, plus co-op placement

Students with deficiencies in some areas of Computer Science may be required to make up those deficiencies by registering in undergraduate courses prior to or as part of their graduate program or by following a program of supervised reading.

Major requirements:

- The major requirements for the Master of Science Degree in Computer Science include successful completion of five approved courses and a thesis. (A thesis is a major research project which must involve substantial innovative work generally culminating in original results.)
- In addition to the above course work, students must attend regular departmental seminars throughout their M.Sc. studies, as a fulfillment of this requirement.

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Other requirements:

- With prior approval of the graduate coordinator, candidates may be permitted to include graduate courses offered by other departments in their program.
- No student will be allowed to include in his or her program a course which substantially overlaps a course previously taken.
- All candidates' programs are subject to approval by the graduate committee of the School of Computer Science.

Recommended options (if any):

Students participating in the co-op option must satisfy the following conditions:

- Have been a full-time student in the Master's program in Computer Science;
- Have successfully completed a minimum of one study term;
- Have at least one semester remaining in a maximum of three years in the Master's program;
- Have obtained written permission from the academic supervisor/co-supervisors;
- Have their placement(s) confirmed by the Centre for Career Education
- Are not planning to take courses during the work terms.

Guidelines for work-term reports and other co-op assignments:

The School of Computer Science has detailed guidelines for the format, structure, preparation, and evaluation of co-op term reports. In particular, graduate students in the co-op program must contact their supervisors during co-op placement about the selection of a report topic, and, at the end of co-op placement, about report writing and evaluation. While the staff at the Centre for Career Education will communicate with employers regarding to students' performance at work, under the coordination of the Graduate Coordinator, the academic supervisors will communicate with students to ensure desired learning outcomes.

Standing Required for Continuation in Program

GPA requirements for continuation in the program: these should be in-line with the regulations for standing required for continuation in the program as set out in the undergraduate and graduate web calendars [www.uwindsor.ca/calendars].

The Faculty of Graduate Studies and Research requires that students maintain at least an 8.0 cumulative GPA at all times.

Standing Required for Graduation

Minimum GPA requirement to graduate in the program: these should be in-line with the regulations for standing required for continuation in the program as set out in the undergraduate and graduate web calendars [www.uwindsor.ca/calendars].

Satisfactory performance in all aspects of the program (course work, thesis or major paper) must be achieved. The Faculty of Graduate Studies and Research requires that students must attain at least an 8.0 cumulative GPA to graduate.

Program and Work/Study Sequencing

Provide program and work/study sequencing for each year of the program.

Please ensure that all pre-requisites are met in the sequencing.

NB: The proposed work/study sequence or alternative arrangement should allow for year-round availability of students for employers (if appropriate) and, wherever possible, should meet the guidelines for co-operative education as set out by the Canadian Association for Co-operative Education (see Policy on Co-op Programs).

Students must successfully complete two semesters of co-op work terms. A typical sequence is given in the table below.

Year	Fall	Winter	Summer
1	Study	Study	Work

PROGRAM DEVELOPMENT COMMITTEE

NEW PROGRAM/MAJOR PROGRAM CHANGES

FORM 2 (Co-op)

2	Work	Study	Study
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Student Workload

Provide information on the expected workload per course credit (3.0) of a student enrolled in this new program/major program change.

Expected Workload per 3.0 Course Credit	Average Time the Student is Expected to Devote to Each Component Over the Course of the Program
Lectures	3 hrs / week
Tutorials	---
Practical experience	---
Independent study	6 hrs / week
Reading and work for assessment, including meeting classmates for group work/project assignments (essays, papers, projects, laboratory work, etc.)	25-30 hrs / semester
Studying for tests/examinations	15 hrs / semester (where relevant)
Other: <u>[specify]</u>	---
How does the student workload for this program compare with other similar programs in the department/program area? There is no workload change to the graduate courses. For each work term, students are in full-time co-op placement for a minimum of 12 weeks.	