

## Background

Ryerson has been offering the M.Sc. in Computer Science since 2007. With 8 years of experience the time was ripe to consider the strengths and weaknesses and adapt the program going forward.

While the quality of supervision remains high and the student experience remains positive, meeting our registration targets has been somewhat problematic, and many students find it difficult to complete within 2 years. With the increasingly competitive graduate market in Ontario, it is apparent that our expectations for the number of courses that a student will have to complete in addition to a thesis is out of line with our comparator Ontario universities (see Appendix A).

Most of our comparator universities also have some form of course-based M.Sc. designed to appeal to students more interested in a professional designation than in a career in research. This form of graduate study is particularly relevant in the GTA with its concentration of computer-based industry.

The current program is thesis-only and has the following requirements:

1. a research thesis (milestone);
2. CP8101 - Research Methods (pass/fail);
3. CP8102 - Computer Science Seminar (Masters) (pass/fail)
4. 5 elective graduate courses;

## Motion

The Computer Science Graduate Program Council proposes to modify the M.Sc. Program so that it allows applicants to choose from the following three options.

1. Thesis-based option: This is a modified version of the current program consisting of:
  - (a) 4 elective graduate courses;
  - (b) a research thesis (milestone);
  - (c) attendance at departmental seminars and providing at least 1 public presentation in addition to thesis defense (milestone approved by supervisor).
2. MRP-based option: This is a new option consisting of:
  - (a) 6 elective graduate courses;
  - (b) a Major Research Paper (MRP);
  - (c) attendance at departmental seminars and providing at least 1 public presentation (milestone approved by supervisor).

Operational requirements for the MRP are presented in Appendix B.

3. Course-based option: This is a new option consisting of:

- (a) 8 elective graduate courses, excluding CP8101, “Research Methods” and CP8310, “Directed Studies”.

In addition the following course changes.

1. Modify CP8101, “Research Methods” from being Pass/Fail to become a graded course available as an elective course in the Thesis and MRP options, and to make it anti-requisite to CP8310, “Directed Studies”.
2. Modify CP8310, “Directed Studies” to make it anti-requisite to CP8101, “Research Methods”.
3. Delete CP8102, “Computer Science Seminar (Masters)”.

Students applying to the M.Sc. program will initially be presented with two options: (a) the Thesis option and (b) the Course option. The latter group may transfer to the MRP option after the first term of courses (following the rules under “Switching Options” below).

Students in all options of the M.Sc. program will be required to enrol as full-time students for a minimum of one year (3 terms).

## Switching Options

**Course→MRP** Applicants to the M.Sc. program can opt for either the Thesis option or the Course options in their application. In the latter case they may transfer to the MRP option at the end of the first term, assuming all necessary conditions are met: (a) the application to make such a transfer is provided in writing; (b) a program faculty member agrees to supervise; and (c) the Graduate Program Director approves the transfer.

**Course/MRP→Thesis** There may be exceptional circumstances in which a Course or MRP option student may wish to switch to the Thesis option. This is permissible if: (a) the application to make such a transfer is provided in writing; (b) the prospective faculty supervisor agrees and provides a letter of support; (c) there is sufficient time to complete a high-quality thesis (normally 3 terms); and (d) the Graduate Program Director approves the transfer.

**Thesis→Course/MRP** There may be circumstances where a Thesis-option student wishes to switch to the Course or MRP-based option. This is permissible if: (a) the application to make such a transfer is provided in writing; (b) in the case of transferring to the MRP-based option, a program faculty member agrees to supervise; and (c) the Graduate Program Director approves the transfer.

## A Computer Science M.Sc. Programs in Ontario

Institution	Number of elective courses (Research methods?)	Seminar attendance (public presentations)
Ryerson (now)	5+RM (thesis)	4 terms course
Ryerson (new)	4 (thesis), 6(MRP), 8(course)	1 presentation + seminars
Toronto	4 (thesis) <sup>1</sup> , 6 (internship) <sup>2</sup>	-
Western	4 (thesis), 6 (project), 8 (course) <sup>3</sup>	-
McMaster	4 (thesis) <sup>4</sup> , 6 (project) <sup>5</sup>	-
Waterloo	4 (thesis), 7 (project), 8 (course) <sup>6</sup>	-
Queens	4 (thesis), 7 (project), 8 (course) <sup>7</sup>	-
Brock	4 (thesis) <sup>8</sup>	department seminars
Guelph	4+RM (thesis) <sup>9</sup>	1 presentation
Ottawa-Carlton	5 (thesis), 8 (project) <sup>10</sup>	1 presentation + 10 seminars
Windsor	5 (thesis) <sup>11</sup> , 8 (project) <sup>12</sup>	department seminars
York	5 (thesis), 7 (project) <sup>13</sup>	-
UOIT	5+RM (thesis) <sup>14</sup>	1 term course
RMC	6 (thesis) <sup>15</sup>	-
Lakehead	6 (thesis), 10 (course) <sup>16</sup>	1 term course

Note that Laurier, Algoma, Laurier, and Trent have no M.Sc. in Computer Science.

<sup>1</sup><http://www.sgs.utoronto.ca/calendar/Pages/Programs/Computer-Science.aspx#CS>

<sup>2</sup><http://www.sgs.utoronto.ca/calendar/Pages/Programs/Computer-Science.aspx#AC>

<sup>3</sup>[http://www.csd.uwo.ca/current\\_students/graduate\\_students/msc\\_degree\\_requirements.html#course\\_study](http://www.csd.uwo.ca/current_students/graduate_students/msc_degree_requirements.html#course_study)

<sup>4</sup>[http://www.cas.mcmaster.ca/cas/0files/reg\\_master\\_cs\\_2014.pdf](http://www.cas.mcmaster.ca/cas/0files/reg_master_cs_2014.pdf)

<sup>5</sup>[http://www.cas.mcmaster.ca/cas/0files/reg\\_meng\\_cs\\_2014.pdf](http://www.cas.mcmaster.ca/cas/0files/reg_meng_cs_2014.pdf)

<sup>6</sup><https://cs.uwaterloo.ca/current-graduate-students/overview-degree-programs/master-mathematics-computer-science#>

<sup>7</sup><http://www.cs.queensu.ca/students/graduate/GradHandbook/msc.php>

<sup>8</sup><http://www.cosc.brocku.ca/graduate/degrees>

<sup>9</sup><https://www.uoguelph.ca/registrar/calendars/graduate/2014-2015/gradprog/cis-msc.shtml>

<sup>10</sup><http://www.scs.carleton.ca/future-students/graduate-program/mcs-program>

<sup>11</sup><http://web4.uwindsor.ca/units/registrar/calendars/graduate/cur.nsf/0/65C343D9844D2ED0852572BF005EC932>

<sup>12</sup><http://www1.uwindsor.ca/professional/master-of-applied-computing>

<sup>13</sup><http://eecs.lassonde.yorku.ca/course/computer-science-msc/>

<sup>14</sup><http://science.uoit.ca/graduate/computer-science/msc-degree-requirements.php>

<sup>15</sup><http://www.rmc.ca/aca/ac-pe/gsc-adc/au-ua/fs/mcs-mi-eng.php>

<sup>16</sup><https://www.lakeheadu.ca/academics/departments/computer-science/graduate-students>

## B Major Research Paper Requirements

The Major Research Paper should present the exploration of a practical, empirical or theoretical question or problem related to the broad field of Computer Science. A MRP need not involve original research but it must explore a well-defined problem. It may take the form of the exploration of existing work or the implementation of a new system exhibiting or demonstrating computing principles. The MRP is intended to be a research project that is narrower in scope, less sophisticated in methodology, or less complete in data gathering than would be required for a thesis.

Enrolment into the MRP-based option is subject to a Program faculty member agreeing to supervise. Work for the MRP will normally spread over two terms and requires the supervision of a Program faculty member. The MRP will be evaluated by the supervising faculty member and a second reader, normally second Program faculty member.

### Format

The MRP must be formatted using the Ryerson YSGS guidelines.<sup>17</sup>

### Supervisor

The student is responsible for approaching potential supervisor(s), who must be member(s) of the Program Faculty. The Graduate Program Director can assist students to identify potential supervisors. An appropriate form to formally document faculty supervision shall be submitted to the Graduate Program Administrator and approved by the Graduate Program Director.

### Proposal

The MRP proposal (not exceeding 8 pages) should contain the following sections:

- Title, name of student and supervisor
- Introduction – set the context for your project
- Literature review – mention key prior art that is relevant to the proposed project; this is not meant to be a full review at this stage
- State the specific objectives of the project – clear statement of the study question and why it is important?
- Methodology and approach - What methods and tools will be used?
- A detailed work plan – the stages of your project in table format, indicating dates and outputs
- Anticipated research output
- List of references.

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<sup>17</sup>[http://www.ryerson.ca/content/dam/graduate/documents/Thesis\\_MRP\\_Dissertation\\_Guidelines\\_2012.pdf](http://www.ryerson.ca/content/dam/graduate/documents/Thesis_MRP_Dissertation_Guidelines_2012.pdf)

A copy of the “Major Research Paper Checkpoint Form” shall be submitted with this document to the Graduate Program Administrator and must be approved by the supervisor and the Graduate Program Director.

### **Second Reader**

The MRP shall be evaluated by the supervisor and a second reader (who will be a member of the Program Faculty). While it is not necessary to immediately select a second reader, it is advisable that a second reader be selected before the MRP proposal is finalized.

Students may consult the second reader prior to the completion of the draft, but the second reader cannot act in the capacity of a co-supervisor and must remain “at arm’s length” from the paper.

### **Evaluation**

Upon completion of the MRP the supervisor and second reader will evaluate it and determine whether it is deemed satisfactory or unsatisfactory. In the event that the second reader finds the paper unsatisfactory, he or she should consult with the supervisor about possible revisions. The second reader may request minor or major revisions before the final paper is accepted and submitted to the program.

A written evaluation will be submitted to the Graduate Program Administrator, signed by both the supervisor and the second reader. The supervisor and the second reader may opt to meet with the student to discuss the paper but this is not required. The completed “M.Sc. MRP Supervisor and Second Reader Report” will be filed.

### **Final Submission**

The student is responsible for submitting two hard copies of the paper—one for each reader.

After the evaluation, the student must deposit a final copy (after completing any revisions requested by the readers) with the Graduate Program Administrator. The result of the evaluation will not be submitted to the Registrar’s Office until the final copy has been deposited.