Computer Science
UNIVERSITY OF TORONTO

2015-2016

DCS GRADUATE STUDENT HANDBOOK:

MSC PROGRAM REQUIREMENTS

Introduction

This document describes the MSc program in the Department of Computer Science (DCS). For a general overview of the various graduate programs provided by DCS, along with a course listing, see the DCS Graduate Student Handbook: Overview of Programs.

The MSc degree program consists of four graduate half-courses, which satisfy the MSc breadth requirement, and a major research paper. The major research paper should demonstrate the student's ability to do independent work in organizing existing concepts and in suggesting and developing new approaches to solving problems in a research area.

MSc Course Requirement

The **course requirements** are the minimum number of courses required by a degree program. In order to obtain credit for a course, the student must obtain a mark of B- or higher.

Students in the MSc program are required to complete four graduate half courses while registered in the program. The only exception to this is for students who obtain a transfer credit for graduate courses which were completed but were *not used toward the requirements of another degree, diploma, certificate, or any other qualifications.*

MSc Breadth Requirement

The **breadth requirements** for our degree programs ensure that students complete courses from a sufficiently wide range of topics within Computer Science.

The Master's degree requires breadth in **methodologies**. Methodologies are core problem-solving approaches/techniques used throughout computer science. Courses are classified according to four broad methodologies, based on their content. The list of courses in each of the four methodologies is given in Appendix A of the DCS Graduate Student Handbook: Overview of Programs. Courses not on these lists do not qualify for breadth credit, unless this is explicitly noted in the course schedule posted by the Graduate Office. In particular, courses from other departments do not count towards Computer Science breadth (except in the rare cases noted in the DCS course schedule).

To satisfy the MSc breadth requirement the student must complete one course from at least three of the four methodology areas. Often the student chooses to take two courses from one of the methodologies and none from the fourth. It is also possible to take three Computer Science courses, with one course from each of three of the methodologies. In this case a student can take a graduate half-course from another department at U of T, and thereby satisfy both the course and breadth requirements for the MSc program. Alternatively, it is also suitable to choose one course from each of the four methodologies. Below are brief descriptions of the four methodological areas.

The Four Methodologies

Methodology 1: Analysis and Computation in Discrete Models

The courses in this grouping focus on analysis of and algorithms for discrete mathematical structures, such as graphs, formal logic, and formal models of computation. The grouping includes courses that analyze computational limitations and discrete computation. These courses study and apply techniques from areas like probability, combinatorics, algebra, mathematical programming, and formal logic.

Methodology 2: Analysis and Computation in Continuous Models

The courses in this grouping focus on analysis of and algorithms for continuous mathematical models. Topics include the derivation of mathematical models, their properties, and computational techniques for approximating their solution. These courses study and apply techniques from areas like probability and statistics, computer graphics, computer vision, numerical analysis and machine learning.

Methodology 3: Building Software and Hardware Artifacts

This grouping includes courses that study the design and implementation of specific software or hardware artifacts. These courses expose students to the challenges in building artifacts such as computer-animated movies, computer aided design systems, databases, network protocols and devices, and simulations of large scale systems. Courses in this group typically have a significant project component where students build a substantial software or hardware artifact.

Methodology 4: Human-Centered and Interdisciplinary Computing

This grouping includes courses that study computational paradigms and methods within human - computer interaction and scientific domains outside traditional computational sciences. These courses typically have a cross-disciplinary component, involving fields such as the life sciences, linguistics, psychology, social sciences, and economics.

Student Supervision

Every MSc student will be assigned a supervisor prior to registration. The supervisor advises on course selection, research topic selection, and provides continuing help during the conduct of research. All students are required to consult frequently with their supervisors throughout their graduate studies, to report on their progress and direction and to obtain advice.

DCS prides itself on allowing students to pursue their interests as far as possible and we find that approximately ten percent of our students switch supervisors after they have arrived and learned more about research opportunities in different areas. That said, the ability to switch supervisors depends on the availability of another faculty member to serve in this role. A Supervisory Committee Composition Form must be submitted to seek approval for change of supervision

Occasionally the student-supervisor match is not productive. The student should discuss difficulties or concerns with the current supervisor. In many cases the reason for wanting the change is an issue which might be resolved by talking it out. If no resolution can be found, students who feel a need to change supervisor are welcome to seek advice from the Associate Chair, Graduate Studies.

To be the primary or sole supervisor of an MSc student a faculty member must hold an associate or full membership in the School of Graduate Studies, with a specific graduate faculty appointment in the Department of Computer Science (i.e., a CS-SGS membership).   Faculty with an emeritus appointment in CS-SGS can also supervise MSc students, but require approval from the Graduate Office before taking on any new supervisory role. When an MSc student is co-supervised, at least one of the co-supervisors must be identified as the primary supervisor (aka supervisor of record), and this faculty member have be an associate, full, or emeritus membership in CS-SGS.

Timeline

Month	MSc Program Administration
1 to 2	Submit **Breadth Evaluation and Plan of Study Form** to DCS Graduate Office.
12	**Coursework:** MSc students should manage their time so that at least 3 half-credit courses can be completed within the first 12 months, leaving at most one half-course for the remaining 5 months **Research:** In addition to course work MSc students should select their research topic and begin their research within the first 12 months of their program. One way to achieve this is to take two half courses in the first term, and one in your second term. The first two half-courses should provide you with more in-depth knowledge of possible research areas and, by taking only one half-course in your second term, you should have time to begin making progress on your research.
17	**MSC STUDENTS GRADUATING:** **Coursework:** All coursework must be completed with a grade of at least B- for students wishing to complete the MSc degree and graduate. **Research Paper:** The Research Paper is to be submitted and approved by two readers. Please allow your readers two weeks for your readers to review your Research Paper. Reader reports are then to be submitted to the Graduate Office at least two days prior to the SGS deadline.

	MSC STUDENTS GRADUATING AND CONTINUING TO PHD: Read the instructions for MSc-PhD Transition Procedure in this handbook.

Research Paper

- Should demonstrate the student's ability to do independent work in reviewing the relevant literature, identifying a problem in a research area, organizing existing concepts, suggesting and developing new approaches to solving problems in a research area, and reporting the results.
- The standard for this paper is that it could reasonably be submitted for peer-reviewed publication. Negative results are also acceptable given a reasonable prior hypothesis and a thorough analysis of the reasons for these negative results.
- Length: a rough guideline is 30 – 60 pages, double spaced.

Approval of Research Paper

- Must have the written approval of two readers, one of whom must be the student's supervisor.
- The second reader must hold an associate, full, or emeritus membership in the graduate faculty at the School of Graduate Studies (in any U of T department). The readers should be given at least two weeks to review the paper. They will then submit their evaluation of the paper to Graduate Office for review and consideration by the Associate Chair, Graduate Studies.
- If the research paper is unacceptable to either reader, the reader will provide the student with a list of deficiencies, and the student is given an opportunity to improve the research paper. After improvement, the research paper is again submitted to two readers; normally they will be the same two readers but in exceptional circumstances, with the approval of the Associate Chair, Graduate Studies, the second reader may be different.

Graduation

- Given the completion of the course and breadth requirements, and approval of the two reviews on the research paper, the Graduate Office will submit a Recommendation for Degree to SGS and the student's name will be added to the convocation roster.
- A graduation package will be sent to the student from the Convocation Office regarding convocation dates, tickets, etc.

Time Limit to Degree Completion

There are two time limits. SGS time limits refer to the amount of time a student can register in their program. The departmental deadline refers to the amount of time a student can receive guaranteed funding from the department.

For the MSc program the guaranteed funding period is 17 months.

Students who have serious health problems or personal circumstances that prevent them from making satisfactory progress are entitled to take a leave from graduate studies. Such leave effectively stops the clock for both funding and time to degree completion; on return, the student is entitled to resume at the point where they left, without penalty.

The SGS maximum time limit for the MSc program is 3 years. In exceptional circumstances, a MSc student who did not complete all the requirements for the degree within three years may be considered for a maximum of three one-year extensions provided that the graduate unit concerned so approves. The first two extension requests require the approval of the Associate Chair, Graduate Studies; the third requires the approval of both from Associate Chair and School of Graduate Studies.

Internships and Leaves

Internship is not a component of the MSc program in the Department of Computer Science. However, it is recognized as an important experience for graduate students.

Students must request an official leave of one to three terms for the purpose of doing an internship by completing an SGS Request for Leave of Absence form (www.sgs.utoronto.ca/), under Forms for Students), and submitting it to the Computer Science Graduate Office with a brief note indicating the benefits (other than financial) of the internship opportunity. The note must be signed by the student and the supervisor.

A student who is planning an internship over the summer are required to submit their Leave of Absence form by the Jan. 31 prior to their leave. For a fall internship, they must submit the form June 30. For an internship in the winter term, the form must be submitted by the previous Oct. 15. In all cases, if there is a substantial reason you are unable to meet the deadline, contact the Graduate Office. Failure to meet these deadlines ends up costing the department money, and this charge could be passed on to you.

A leave for internship can be taken for one to three terms. Official leaves are granted for an entire term and cannot be prorated to months or weeks. If your internship falls outside of a normal academic term, please consult with the Graduate Office.

Funding: Funding will be put on hold for the duration of the internship leave. You must notify the Graduate Office when you return from leave so that your registration and funding can resume.

What Happens to Scholarships: Check the regulations of any scholarship(s) you are receiving to be sure that the agency will allow a break for work experience and deferral of payments.

NSERC recipients are required to submit the form "Request for Deferment or Interruption of Award" and, in some cases, an NSERC Progress Report as well. The forms are at www.nserc.ca. These documents are to be submitted to the Graduate Office for approval and signatures. SGS email contact for questions on NSERC is graduateawards@sgs.utoronto.ca.

OGS does not allow a break for internship unless it is part of the degree requirement. The OGS rule is that students are permitted to work a maximum of 10 hours a week while registered as full-time students. SGS email contact for questions on OGS is graduateawards@sgs.utoronto.ca. If you hold an OGS award and wish to do an internship, please contact the Graduate Office for advice.

Tuition Fees: Graduate School tuition fees are assessed on a program basis rather than on the number of courses taken or the number of sessions per year. Students are permitted to pay their program tuition fees in two parts, payable in the Fall and Winter Sessions. Graduate students who have paid tuition for the full year do not, in effect, pay tuition for the summer months but remain registered for that period. When a student takes a leave for any purpose, s/he will not be registered in the program for the duration of the leave.

Funding and Time to Completion of Degree: For SGS approved leaves the remaining funding, the remaining components of your program and the time-to-completion for your degree will be extended by the amount of time (number of terms) taken for the internship. This is calculated per term and cannot be prorated by weeks or days.

A break in registration may impact income tax calculations. Also, it may mean that any student loans will be immediately payable - you should check with your loan agency about repayment regulations. International students should ensure that they have an appropriate visa that will allow them to not be registered as a student while they work at an internship.

MSc- PhD Transition Procedure

Roughly half of our MSc students intend to continue on to complete a PhD, and the procedure for doing this is described next.

Requirements:

The following requirements must be completed to be considered for transition to the PhD program. Forms referenced here are available on the DCS web site under "Your Program" and under the link "Forms".

All program requirements of the MSc must be completed. This includes:
1.   All required course work.
2.   Breadth requirements.

3. Completion of a research paper that has been read and approved by two faculty members.
4. Submission of signed **EVALUATION OF MSC RESEARCH PAPER** forms from the two readers of your research paper to the graduate office. Both readers must indicate in their evaluation that your MSc Research paper achieves the standard expected for transition to the PhD program and complete the corresponding section of the evaluation form. (labeled "COMPLETE ONLY IF STUDENT WANTS TO CONTINUE TO THE PHD PROGRAM"). Reference letters containing additional comments in support of the PhD application should be included.
5. Typically one of the two readers indicates on their evaluation form that they are interested in supervising your PhD studies. Otherwise, if you plan to continue your PhD studies with a new supervisor, the new supervisor must provide a written verification of their intention to serve in this role. An appropriate PhD supervisor with sufficient funding must be identified before the transition to the PhD program can be approved. Note that, in order to be permitted to supervise a DCS PhD student, a faculty member must first have a full or emeritus membership in CS-SGS (and, in the case of an emeritus members, have the approval of the Associate Chair, Graduate Studies).
6. Submission of a "**REQUEST TO TRANSITION FROM MSC TO PHD PROGRAM IN COMPUTER SCIENCE**" form to the Graduate Office.
7. Upon approval for transition, student must complete an SGS admission application and pay the application fee in order to register in the PhD program

Request to Transition Deadlines:
SGS only allows students to change registration at the start of each academic term (September, January and May).

Approved students will be allowed to transition to the PhD program without interruption in their departmental funding upon completion of their Master's. The only exception to this would be when a student is requesting dual registration, in which case PhD funding will commence only upon completion of Master's. Students may be dually registered (for a maximum of one term) in either the Fall or Winter sessions. Dual registration is not permitted in the summer term.

If you have non-departmental funding (e.g., an external scholarship) this funding might continue depending on the specific rules of the funding source, but any departmental additions (e.g., top-ups) will cease until you can be registered as a PhD student.

If you have taken an SGS approved leave of absence during your MSc program the above deadlines will be extended accordingly.

Your 43 additional months of departmental funding for the PhD program will start from the time your funding recommences.