

# DEPARTMENT OF COMPUTER SCIENCE GRADUATE HANDBOOK

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Portions of this document are reproduced from the 2017 Faculty of Graduate Studies Regulations, the 2017 Department of Computer Science Supplementary Regulations, and the 2012 Department of Computer Science Graduate Student Handbook.

## CONTENTS

Disclaimer .....	3
Department of Computer Science .....	3
Administration of Graduate Programs .....	3
Faculty of Graduate Studies .....	3
Department Head.....	3
Graduate Associate Head .....	4
Graduate Studies Committee.....	4
Advisor .....	4
Advisory Committee.....	5
Registration .....	6
Courses .....	6
Graduate Courses Offered .....	6
Minimum Grade .....	6
Classification.....	6
Registering for Courses .....	6
Courses Outside Computer Science .....	7
Procedures .....	7
List of Approved Courses .....	7
Undergraduate Courses .....	7
Progress Reports.....	8
Pre-MSc .....	8
Admission Requirements .....	8
Course Requirements.....	8
Program Duration.....	8
Timeline.....	8

Coursework MSc.....	8
Admission Requirements .....	8
Course Requirements.....	9
Program Duration.....	9
Transfer to Thesis MSc .....	9
Co-op Option .....	9
Timeline.....	9
Thesis MSc .....	10
Admission Requirements .....	10
Course Requirements.....	10
Thesis Proposal.....	10
MSc Thesis.....	11
MSc Thesis Defence.....	11
MSc Thesis Examining Committee .....	11
Scheduling the Thesis Defence .....	11
Examiners Participating by Video Conference .....	12
Thesis Defence Procedure .....	12
After the Thesis Defence.....	12
Program Duration.....	12
Transfer to Coursework MSc.....	12
Transfer to PhD .....	13
Timeline.....	13
PhD .....	13
Admission Requirements .....	13
Course Requirements.....	13
Thesis Proposal.....	13
Candidacy Exam .....	14
PhD Thesis .....	14
PhD Thesis Defence .....	15
PhD Thesis Examining Committee .....	15
Examiners Participating by Video Conference .....	15
Thesis Defence Procedure .....	15
Program Duration.....	16
Timeline.....	16

Disputes, Disciplinary Action, and Appeals.....	16
Request for Time Extension .....	16
Academic Misconduct .....	16
Appeals.....	17

## DISCLAIMER

Should discrepancies appear between the information in this document and the University of Manitoba General Calendar or the [Department of Computer Science Supplementary Regulations](#), the latter shall prevail.

## DEPARTMENT OF COMPUTER SCIENCE

The [Department of Computer Science](#) at the [University of Manitoba](#) offers programs leading to a Doctor of Philosophy degree (PhD), thesis-based and coursework-only programs leading to a Master of Science degree (MSc), a pre-master's program to help students qualify for the MSc program, major and honours Bachelor's degrees (BSc), as well as BSc degrees with co-operative work terms, and joint programs with mathematics, statistics, and physics.

Computer Science offers its undergraduate programs as a department in the [Faculty of Science](#) and its graduate programs as a department in the [Faculty of Graduate Studies](#). The Department of Computer Science's honours and major BSc programs are accredited by the Canadian Information Processing Society's (CIPS) Computer Science Accreditation Council (CSAC).

The department includes 30 professors and instructors, approximately 75 graduate students, and over 700 undergraduate students.

## ADMINISTRATION OF GRADUATE PROGRAMS

### FACULTY OF GRADUATE STUDIES

The University of Manitoba is a public institution, established in 1877 by an act of the Manitoba Provincial Legislature. Graduate work and research have been conducted at the University from its beginning. The first PhD was granted in 1928, and the first PhD in the sciences in 1930. The Faculty of Graduate Studies was established in 1944 to systematize and foster graduate study throughout the University. While the development and teaching of graduate programs is primarily the responsibility of the departments within the University, the Faculty of Graduate Studies sets common standards and is in charge of their administration. As such, the Faculty admits students, monitors their progress and authorizes all graduate degrees. The Faculty of Graduate Studies is a member of the Canadian Association of Graduate Schools. The University is a member of the Association of Commonwealth Universities, the Association of Universities and Colleges of Canada and the International Association of Universities.

### DEPARTMENT HEAD

The Department Head, along with the Department Council and the Dean of the Faculty of Science, are the arbiters of department policy.

## GRADUATE ASSOCIATE HEAD

The Graduate Associate Head chairs the department's Graduate Studies Committee (GSC) and directs the operation of the Computer Science graduate program. The Graduate Associate Head provides advice and counseling to any individual in a Computer Science graduate program, and directs the program of students who do not have an advisor. The Graduate Associate Head, with the assistance of the Academic Administrative Assistant, sees that the Department's policies and procedures are carried out in a timely and effective manner.

## GRADUATE STUDIES COMMITTEE

Graduate programs are regulated and supervised by the department's Graduate Studies Committee (GSC) consisting of the Graduate Associate Head, the Department Head, five additional Computer Science faculty members, a Computer Science graduate student, and the Academic Administrative Assistant. The GSC is the main policy formulating and regulating body for matters related to the graduate program in Computer Science. The GSC is advisory to the Department Head; the Department Head and the Department Council are the final arbiters of department policy.

The terms of reference of the GSC include:

1. Deciding on admissions policies and procedures, making admission decisions, and recommending conditions of entry to all graduate programs.
2. Approving MSc programs (including final approval of thesis proposals) and acting as Chairs for MSc thesis defences.
3. Approving PhD programs and acting as Chairs for PhD candidacy exams.
4. Evaluating potential graduate courses before they are offered (as well as courses that have changed substantially between offerings) and evaluating graduate courses taken outside Computer Science for credit towards a graduate program.
5. Recommending the course of action to be taken on deficient grades and other evidence of unsatisfactory progress.
6. Recommending the course of action for disciplinary situations such as plagiarism, according to the regulations of the department, the Faculty of Graduate Studies, and the University.
7. Approving applications for early transfer of an MSc student to the PhD program.
8. Approving applications for time extensions or leaves of absences (in consultation with advisor and/or committee) and for other changes in a student's program status.
9. Undertaking curriculum reviews and approving new course descriptions and course changes, after which these are forwarded to Departmental Council and the Faculty of Graduate Studies.
10. Maintaining an up-to-date Graduate Student Handbook and calendar of critical dates for graduate students.

## ADVISOR

Every student has an advisor (appointed before admission to the program) to help him or her formulate a program of study and to act as the first source of advice and counseling. In particular, the advisor will oversee the student's progress in research and coursework. The Graduate Associate Head acts as advisor for coursework MSc and pre-MSc students. The student must discuss all program changes, including all changes in registration, with the advisor

and obtain the advisor's approval before the Academic Administrative Assistant will process any course or program changes. If a student does not receive the help he or she needs from the advisor and has made every effort to consult with the advisor, then the student is encouraged to meet the Graduate Associate Head or the Department Head for further assistance.

Upon approval of the Department Head, an advisor and a maximum of one co-advisor may advise a student. The co-advisor must meet all of the same qualifications and expectations as the advisor. When an advisor and co-advisor are assigned, together they shall fulfill the role of the advisor (that is, neither shall fulfill any other advisory committee or examining committee membership requirements for that student). One advisor must be identified as the primary advisor.

## ADVISORY COMMITTEE

Each thesis MSc student and PhD student must have an advisory committee appointed within eight months of the start of the student's program. This committee provides research advice and guidance; often, advisory committee members have expertise in a related field of research that complement those of the advisor(s). The advisory committee consists of the advisor (and co-advisor, if any) and two additional members. These additional members must be members of the Faculty of Graduate Studies (i.e., they must hold an appointment at the University of Manitoba as Assistant Professor, Associate Professor, Professor, Adjunct Professor, Professor Emeritus, or Senior Scholar). At least one of the additional members must be from Computer Science. For MSc students, the second additional member may be from any department or unit at the University of Manitoba, including Computer Science. For PhD students, at least one of the members must be from a department or unit outside of Computer Science at the University of Manitoba. Note that Adjunct Professors in Computer Science at the University of Manitoba hold an appointment in the Department of Computer Science, and are not eligible to represent a department or unit external to Computer Science on a PhD advisory committee.

The advisory committee will handle primary reviews of the student's thesis proposal (before submitting these for final approval) as well as approve the student's progress reports. The advisory committee must meet with the student at least annually.

Coursework MSc students and pre-MSc students do not have an advisory committee.

The advisory committee is proposed by completing a form (available on the [Department of Computer Science website](#)), signed by the student and all committee members. Names of nominated MSc advisory committee members are circulated to GSC by the Graduate Associate Head for comments and advice before approval by the Department Head. Names of nominated committee PhD advisory committee members are evaluated by the Graduate Associate Head before approval by the Department Head and the Faculty of Graduate Studies.

A thesis MSc student's Advisory Committee is not required to be the same as his/her Thesis Examining Committee for the MSc thesis defence. The two committees are often the same if the membership of the Advisory Committee satisfies the requirements for an MSc Thesis Examining Committee. The Thesis Examining Committee requires an external member, whereas this is optional for the Advisory Committee. See [MSc Thesis Examining Committee](#). Typically, the members of a student's PhD Advisory Committee are members of that student's PhD Thesis Examining Committee (along with the external examiner). See [PhD Thesis Examining Committee](#).

## REGISTRATION

All graduate students must register for the regular session in mid-July, during the week specified in the Academic Schedule, available on the [University of Manitoba website](#). Candidates should discuss their programs with their advisor before registration. Accepted students who fail to appear and register by the end of the registration period stated on their letter of acceptance will not be admitted unless special prior arrangements have been made with the Head of the Department. Questions about the registration process can be directed to the Academic Administrative Assistant or by speaking with a member of the department in the Computer Science office (EITC E2-445).

Any student whose program of study extends over more than one year must re-register in each succeeding year of the program (both terms) until the degree is obtained. This applies even in the case where the only remaining degree requirement is the final submission of the thesis. Students who fail to re-register will not retain the status of graduate student and must apply for re-admission if they wish to continue studies at a later date.

## COURSES

### GRADUATE COURSES OFFERED

All graduate programs in computer science include course requirements. Graduate courses in Computer Science (7000-level) are offered each fall and winter term, covering a range of specialized and current topics in Computer Science research. Courses are three credits, and, with the exception of Research Methods (COMP 7210), are held in a single term. In recent years, approximately twelve graduate courses have been offered each year, but the number varies from year to year. The selection of courses offered each year depends on a variety of factors, including the research specialization and availability of instructors, how recently a course has been offered, demand for the topic, etc. A list of courses offered each year is available on the [department web page](#).

### MINIMUM GRADE

Students in graduate programs in Computer Science are required to maintain a minimum degree grade point average of 3.0 (B) with no grade below C+.

### CLASSIFICATION

Graduate courses in the Department of Computer Science are categorized by GSC for breadth purposes as being in one of three areas: Systems, Theory, or Applications. (Note: Systems was previously called Fundamentals, and Theory was previously called Foundations). The Department Head will endeavour to ensure that a reasonable number of courses are offered in all three areas each year. Students should be proactive in choosing course areas to satisfy the breadth requirements of their program; there is no guarantee that any particular course will be offered in any given year. See course requirements for the [coursework MSc](#), [thesis MSc](#), and [PhD](#).

### REGISTERING FOR COURSES

Each student must consult his/her advisor before registering for or withdrawing from a course. Registration or withdrawal from a course requires completing a departmental registration form (available on the [department web page](#)), signed by the student and his/her advisor, and submitted to the office of the Academic Administrative Assistant for processing. Students can begin registering for courses in the fall and winter terms in mid-July preceding the start of the term.

## COURSES OUTSIDE COMPUTER SCIENCE

### PROCEDURES

Students in the coursework MSc, thesis MSc, and PhD programs have the opportunity to satisfy a portion of their course requirements by completing graduate courses offered by departments other than the Department of Computer Science at the University of Manitoba. Each of the three programs requires a minimum number of graduate courses to be taken within the Department of Computer Science in the areas of Theory, Systems, and Applications (refer to the corresponding course requirements for each program). To satisfy the course requirements, a student may choose to complete the remaining courses within the Department of Computer Science, or to complete graduate courses from another department that are included on the list of approved graduate courses maintained by GSC. Upon receiving approval from his or her advisory committee (or advisor only if the advisory committee has not yet been formed) and by the Graduate Associate Head, a student may request to have a course added to the list of approved courses. If the recommendation is approved by the advisory committee but not by the Graduate Associate Head, then the decision goes to GSC. Email approval is sufficient. Once approved, the course is added to the list of approved courses. GSC is responsible for maintaining the currency of the list of approved courses and removing courses over time.

### LIST OF APPROVED COURSES

As of November 2017, the following courses have been approved to be taken as part of the course requirements for graduate programs in Computer Science. See the [Department of Computer Science website](#) for any updates.

IMED 7280	Medical Computational Biology
ECE 8220	Digital Image Processing
ECE 7260	Broadband Communication Networks
ECE 7650	Topics in ECE: Advanced Data Processing for Network Security Applications
ECE 7650	Topics in ECE: Online Software Reliability
MATH 8210 (136.821)	Topics in Combinatorics
MATH 7470	Rings and Modules
SOC 7420	Qualitative Research Methods
SOC 7400	Advanced Research Methods in Sociology
PLNT 7690	Bioinformatics
ABIZ 7410	Agricultural Finance
CHSC 7610	Advanced Topics in Community Health I: Seminar in Foundations of Disease Analytics

### UNDERGRADUATE COURSES

Students in the coursework MSc program may take at most two 4000-level undergraduate courses in Computer Science towards their degree requirements. Demand for 4000-level courses is high, and not all requests for registration in 4000-level courses can be accommodated. Students in the thesis MSc and PhD programs cannot take undergraduate courses as part of their requirements; in some cases, students in a thesis MSc or PhD program take a 4000-level course in addition to their degree requirements. Students in the pre-MSc program take all of their courses at the undergraduate level.

## PROGRESS REPORTS

At least one Progress Report must be completed each year prior to registration. Each Progress Report must be completed by the advisor (and if present, the co-advisor and advisory committee) and the student, and provided to the Graduate Associate Head for approval at least two weeks before the Faculty of Graduate Studies deadline. A student or the student's advisor may require additional Progress Reports throughout the year to ensure that student progress is adequate. If the student's next progress report is intended to be done less than a year in the future, the advisor should note this, along with milestones to be completed by that date, on the current Progress Report.

A student is only allowed to have one "In need of improvement" evaluation. A subsequent "In need of improvement" evaluation will normally require the student to withdraw from the program.

## PRE-MSC

### ADMISSION REQUIREMENTS

The pre-MSc program is not a degree program. Students are admitted to the pre-MSc program for one year to take undergraduate courses in Computer Science. Graduates of bachelor degree programs with a minimum grade point average (GPA) of 3.0 in the last two full years of university study will be considered for admission to a pre-MSc program. Admission to a pre-MSc program does not guarantee future admission to an MSc program.

### COURSE REQUIREMENTS

The pre-MSc program is one year in duration, comprising a maximum of 30 credit hours taken at the 3000- and 4000-level, of which a maximum of 24 credit hours may be taken in Computer Science (equivalent to eight Computer Science courses). Courses are selected to complement the individual student's background and help correct any program deficiencies to improve the student's eligibility for admission to the MSc program. Graduate-level courses (7000 level or above) cannot be taken in a pre-MSc program. Courses taken as part of the pre-Master's program may not be transferred to an MSc program at a later date.

### PROGRAM DURATION

The pre-MSc is a one-year program.

### TIMELINE

Mid-July prior to start of term	Register for courses
12 months	Completion of pre-MSc program

## COURSEWORK MSC

### ADMISSION REQUIREMENTS

A recently completed (i.e., normally no more than 5 years old) 4-year honours degree in Computer Science (or equivalent) with a GPA of at least 3.0 (B) or the completion of the pre-MSc program in Computer Science with a



GPA of at least 3.0 (B) is the normal minimum requirement for admission into the coursework MSc program. While 3.0 is the minimum acceptable GPA required by the Faculty of Graduate Studies, the department may require a higher GPA for admission.

Admission to the coursework MSc program is highly competitive. The department receives hundreds of applications each year, with only five to ten spots available for new admissions per year. Graduates of the coursework option would not normally be considered for admission into the PhD program.

## COURSE REQUIREMENTS

A total of 24 credit hours of coursework is required at the 7000 or 4000 levels, typically corresponding to a total of eight courses taken during the MSc program. Of these eight courses, at least six must be graduate courses in Computer Science, including at least two courses in each of the three areas (Theory, Applications, and Systems). The last two courses can be any graduate course in Computer Science, a 4000-level course in Computer Science, or graduate courses from another department included on the list of approved graduate courses maintained by GSC (see [Courses Outside Computer Science](#)).

## PROGRAM DURATION

Full-time students should normally complete the coursework MSc program within two years, while part-time students are expected to make appropriate progress. The maximum time allowed for full-time students is four years. For every full year an MSc student is declared as part time they will receive an additional four months in time to complete their program. For every two years an MSc student is declared as part time they will receive an additional year in time to complete their program.

## TRANSFER TO THESIS MSC

A student in the coursework MSc program can apply to the Graduate Associate Head to transfer into the thesis MSc program if a suitable advisor and thesis topic are found, normally within the first twelve months after entering the coursework MSc program. Upon transferring, graduate courses completed during the coursework MSc are counted towards the degree requirements of the thesis MSc. The student must complete the remaining requirements for the thesis MSc program.

## CO-OP OPTION

In previous years, a co-op option was available in the coursework MSc program. This option is not currently available.

## TIMELINE

Mid-July prior to start of term	Register for courses
24 months	Expected completion of MSc degree

## THESIS MSc

### ADMISSION REQUIREMENTS

A recently completed (i.e., normally no more than 5 years old) 4-year honours degree in Computer Science (or equivalent) with a GPA of at least 3.0 (B) or the completion of the pre-MSc program in Computer Science with a GPA of at least 3.0 (B) is the normal minimum requirement for admission into the thesis MSc program. While 3.0 is the minimum acceptable GPA required by the Faculty of Graduate Studies, the department may require a higher GPA for admission.

### COURSE REQUIREMENTS

A minimum of 15 credit hours of coursework is required at the 7000 level, typically corresponding to at least five graduate courses taken during the MSc program. Of these five courses, one must be Research Methodologies (COMP 7210), to be completed at the earliest possible opportunity, at least three must be graduate courses in Computer Science, including courses in at least two of the three areas (Theory, Applications, and Systems). The fifth course can be any graduate course in Computer Science or any graduate course from another department included on the list of approved graduate courses maintained by GSC (see [Courses Outside Computer Science](#)). The student is expected to complete the course requirements during the first 16 months of the thesis MSc program.

### THESIS PROPOSAL

Every thesis MSc student must, in consultation with his or her advisor, write and submit a formal thesis proposal during the student's first twelve months in the MSc program. A thesis proposal is a written document that must include a preliminary review of pertinent previous work related to the student's proposed research area, a specification of the research topic, a broad formulation of possible research question(s), a description of planned steps to complete the proposed research, including a rough timeline (to the degree to which this is possible at this stage), and a bibliography. The document is intended to allow the student's advisory committee and the Department of Computer Science Graduate Studies Committee to assess the likelihood that the proposed topic has the potential to be developed into an appropriate MSc thesis. A thesis proposal is expected to be from five to eight double-spaced pages in length, not including the bibliography, and no more than fifteen pages plus the bibliography. Exceptions on the length are possible if necessary with permission from the Graduate Associate Head or Department Head.

The student's advisory committee will review the proposal, using a standard review form (available on the [Department of Computer Science website](#)). The advisor's (and co-advisor's, if any) reviews may be considered optional, since due to his or her mentorship in the proposal development process, his or her views should already have been incorporated into the document.

A submission form (available on the [Department of Computer Science website](#)) will then be completed by the advisor, indicating that he or she approves the proposal's submission, that it meets the guidelines of an appropriate MSc thesis proposal, and that the proposal has been reviewed and approved by the advisory committee. This form, the proposal, and the advisory committee's reviews are to be submitted to the Graduate Associate Head for approval by the departmental Graduate Studies Committee. If any member of the advisory committee outside of the advisor/co-advisor is for any reason unable to perform a review, the proposal may still be submitted without the respective supporting review, and the Graduate Associate Head will appoint a member of the Graduate Studies Committee to act as a substitute reviewer. If the proposal is beyond the stated page limit,

or is considered unreadable due to poor writing, it may be rejected at the discretion of the Graduate Associate Head.

The GSC will examine the proposal and reviews. The GSC will then either accept the proposal as it stands, request revisions to be subsequently verified by the Graduate Associate Head, or reject the proposal, requiring revisions and resubmission to the GSC. In the latter two cases, specific feedback indicating what must be done to make the proposal acceptable will be provided by GSC. The student's thesis proposal must be deemed acceptable by GSC during the student's first twelve months in the MSc program. In the case where GSC rejects a proposal or requests formal revisions to be verified by the Graduate Associate Head, the revised proposal must be resubmitted within two months.

## MSC THESIS

The thesis is a written document obeying the thesis guidelines as specified in the Faculty of Graduate Studies Thesis Guideline booklet. In general, the MSc thesis should show that the student has mastery of the field and is fully conversant with the relevant literature.

## MSC THESIS DEFENCE

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### MSC THESIS EXAMINING COMMITTEE

An MSc Thesis Examining Committee consists of the advisor (and co-advisor, if any) and a minimum of two other examiners, one of whom must be from outside the Department of Computer Science. Note that Adjunct Professors in Computer Science at the University of Manitoba hold an appointment in the Department of Computer Science, and are not eligible to represent a department or unit external to Computer Science on an MSc Thesis Examining committee. With the exception of at most one member, the examiners must belong to the Faculty of Graduate Studies at the University of Manitoba. It is common for an MSc student's Advisory Committee to also serve as that student's Thesis Examining Committee, if it meets the requirements defined above. See [Advisory Committee](#).

The student's advisor will recommend a suggested Thesis Examining Committee by completing a Master's Thesis/Practicum Title and Appointment of Examiners form (available from the [Department of Computer Science website](#)). The completed form is to be submitted to the Academic Administrative Assistant, who will forward the form to the Department Head for approval, before submitting the form to the Faculty of Graduate Studies. The form must be submitted at least one month before the defence date to consider the appropriateness of committee members. It will be the duty of the examiners to examine and report on the student's thesis.

In certain instances, the advisor may wish to recommend an external examiner from outside the University of Manitoba. Prior to recommendation to the Faculty of Graduate Studies via the Master's Thesis/Practicum Title and Appointment of Examiners form, an informal inquiry as to the external examiner's willingness to serve should be made by the thesis advisor.

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### SCHEDULING THE THESIS DEFENCE

In order to find an available chair and to ensure the defence is adequately publicized to the department, an MSc Thesis Defence Booking form (available from the [Department of Computer Science website](#)) must be submitted to the Academic Administrative Assistant at least two weeks prior to the scheduled defence date.

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## EXAMINERS PARTICIPATING BY VIDEO CONFERENCE

All members of the examining committee should be present at the examination. If an examining committee member cannot attend the defence in person, prior approval must be obtained from the Faculty of Graduate studies for the defence to proceed with that member participating by video conference. Under no circumstances can the student participate by video conferencing.

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## THESIS DEFENCE PROCEDURE

The Department of Computer Science requires that Master's students give an oral presentation of the results of their thesis research as part of a defence of the thesis. Attendance at the defence is open to all members of the University community and to the public. The defence is chaired by a member of the GSC selected by the Graduate Associate Head (who will find an alternate if no member of GSC is available).

The defence will begin with a 20-30 minute oral presentation by the candidate of the results of the thesis research. This will be followed by two rounds of questions put to the candidate by each member of the examining committee. The advisor may pose questions on behalf of members of the examining committee who are unable to be present. Questioning may be extended if necessary but only under exceptional circumstances should the total time for questions be allowed to exceed 60 minutes. If time permits, following these two rounds of questions the chair may allow an opportunity for questions by other members of the University community in attendance. The chair will note that questions from outside the examining committee will have no bearing on the committee's deliberations.

Following completion of the oral examination, the chair will request all but the examining committee to leave the examination room, and will then survey the examiners for their decisions on the thesis and the defence and obtain their signatures in the appropriate places on the Master's Thesis/Practicum Final Report form. If two or more examiners, or one or more of the examiners and the chair, do not approve the defence, the student will be deemed to have failed the defence.

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## AFTER THE THESIS DEFENCE

As a result of their examination of the thesis, the examiners may require a student to make any revisions to the thesis that they see fit, and the advisor shall see that all such revisions are completed before the report is submitted. An examiner has the right to withhold signing the thesis approval line on the Master's Thesis/Practicum Final Report form until the candidate shows that the agreed-upon revisions have been carried out.

## PROGRAM DURATION

The MSc degree is expected to be completed in two years for full-time students. The maximum time allowed for full-time students is four years. For every full year an MSc student is declared as part time they will receive an additional four months to complete their program. For every two years an MSc student is declared as part time they will receive an additional year to complete their program.

## TRANSFER TO COURSEWORK MSC

A student in the thesis MSc program can apply to the Graduate Associate Head to transfer into the coursework MSc program. Upon transferring, graduate courses completed during the thesis MSc count towards the degree requirements of the coursework MSc. The student must complete the remaining requirements for the coursework MSc program.

## TRANSFER TO PHD

MSc students may transfer to the PhD program within the first 16 months of the MSc program upon the recommendation by the student's advisor/co-advisor and the Department Head. Coursework completed and time spent in the MSc program will normally be credited towards the PhD program. The request to transfer to the PhD program must be submitted to the Faculty of Graduate Studies at least one month prior to the term for which the student intends to commence the PhD program.

## TIMELINE

Mid-July prior to start of term	Register for courses
8 months	Advisory committee appointed
12 months	Thesis proposal approved
16 months	Course requirements complete
1 month before thesis defence	Examining committee appointed
1 month before thesis defence	Thesis document submitted to examining committee
2 weeks before thesis defence	Defence chair appointed
24 months	Expected completion of MSc degree

## PHD

### ADMISSION REQUIREMENTS

The candidate must have completed an MSc degree or equivalent, normally in computer science, and normally having included the writing of an MSc thesis.

### COURSE REQUIREMENTS

A minimum of 12 credit hours of courses at the 7000 level is required beyond the MSc degree, typically corresponding to at least four graduate courses taken during the PhD program. Of these four courses, at least three must be graduate courses in Computer Science, including at least one course in each of the three areas (Theory, Applications, and Systems). The fourth course can be any graduate course in Computer Science or any graduate course from another department included on the list of approved graduate courses maintained by GSC (see [Courses Outside Computer Science](#)). The student is expected to complete the course requirements during the first 24 months of the PhD program.

### THESIS PROPOSAL

Every PhD student must, in consultation with his or her advisor, write and submit a thesis proposal. A thesis proposal is a written document that must include a preliminary review of pertinent previous work related to the student's proposed research area, a specification of the research topic, a broad formulation of possible research question(s), including justification of the originality, quality, and substance of the proposed topic's suitability for PhD calibre research, a description of planned steps to complete the proposed research, including a rough timeline (to the degree to which this is possible at this stage), and a bibliography. The document is intended to allow the student's advisory committee to assess the likelihood that the proposed topic has the potential to be developed

into an appropriate PhD thesis. A thesis proposal is expected to be at most fifteen double-spaced pages in length, not including the bibliography. Exceptions on the length are possible if necessary with permission from the Graduate Associate Head or Department Head. The proposal should normally be completed during the first 18 months of the program and must be approved before the candidacy exam. Extensions are possible if necessary, but delays will be flagged on progress reports. When, in the entire advisory committee's opinion, the thesis proposal is acceptable, the committee will indicate this by signing the Faculty of Graduate Studies Thesis Proposal Form. The signed form along with a copy of the thesis proposal must be submitted to the Graduate Associate Head via the departmental Academic Administrative Assistant.

## CANDIDACY EXAM

The purpose of the candidacy examination is to ascertain whether a student is capable of independent thought and research, has sufficient knowledge of current research and methodologies in all areas relevant to his or her thesis research, and is likely to produce a successful PhD thesis. The candidate is to prepare a written description of the research being undertaken which should include a survey of a significant portion of the relevant literature and provide insight into the thesis progress, both current and planned future research. This document is to be delivered to all Advisory Committee members at least two weeks before the examination date. The examination will be attended only by the candidate, the Advisory Committee, and a member of the GSC who is not on the Advisory Committee and who will act as Chair. The examination will be oral and will begin with a 20-30 minute presentation by the candidate on background research done to date as well as an outline of planned future thesis research. The presentation will be followed by a maximum of two hours of questioning by the Committee. The intent of the questioning is to ascertain the student's breadth and depth of competency in his or her intended research area, and his or her ability to carry out the planned research. Following the examination, the Advisory Committee will determine whether the outcome is a pass or failure. The Chair will communicate the result to the candidate, the department, and FGS.

The candidacy examination should normally be completed during the first 30 months of the program, and cannot precede the approval of the thesis proposal. Extensions are possible if necessary, but delays will be flagged on progress reports.

To allow sufficient time for a GSC chair to be appointed, a PhD Candidacy Exam Booking form (available on the [Department of Computer Science website](#)) must be submitted to the Academic Administrative Assistant at least two weeks prior to the scheduled candidacy exam date.

## PHD THESIS

A requirement of PhD study is the candidate's demonstration of competence to complete a research project and present the findings. The thesis must constitute a distinct contribution to knowledge in the major field of study, and the research must be of sufficient merit to be, in the judgement of the examiners, acceptable for publication.

The thesis must be written according to a standard style acknowledged within the candidate's particular field of study and recommended by the Department of Computer Science, be lucid and well-written, and be reasonably free from errors of style and grammar (including typographical errors). The final version of the thesis must be submitted by the candidate to the Faculty of Graduate Studies following the [Thesis/Practicum Guidelines and Information](#).

## PHD THESIS DEFENCE

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### PHD THESIS EXAMINING COMMITTEE

The PhD Thesis Examining Committee consists of internal examiners (the candidate's advisors, one additional member of the Department of Computer Science, and one member from another unit at the University of Manitoba) and one external examiner. Normally, the internal examiners are members of the student's Advisory Committee; see [Advisory Committee](#). All internal examiners must be members of the Faculty of Graduate Studies (i.e., they must hold an appointment at the University of Manitoba as Assistant Professor, Associate Professor, Professor, Adjunct Professor, Professor Emeritus, or Senior Scholar). In the case of an advisor and co-advisor, both together have a single vote on the examining committee.

The candidate's advisor/co-advisor will recommend to the Dean of the Faculty of Graduate Studies the names of three distinguished scholars from outside the University of Manitoba to serve as the external examiner. The Dean will choose the external examiner from the list provided and will make the formal invitation to the external examiner. No contact should be made with any of the prospective external examiners. The external examiner must hold a PhD or equivalent, hold the rank of Associate Professor, Full Professor, Senior Scholar or Professor Emeritus at a university, have an established reputation in the area of the thesis research, be able to judge whether the thesis would be acceptable at an institution comparable to the University of Manitoba, and have a demonstrated record of supervising PhD students to completion.

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### EXAMINERS PARTICIPATING BY VIDEO CONFERENCE

The attendance of the external examiner in person at the candidate's oral examination is encouraged. If the external examiner will not be present in person, his/her participation via video conferencing is expected. If the external examiner cannot participate electronically, he/she will be asked to provide questions in advance. These questions will be read to the candidate at the defence by the Chair. All internal members of the examining committee are required to be present at the defence, unless exceptional circumstances prevent this. Under such circumstances, and with the prior approval of the Dean of the Faculty of Graduate Studies, one internal member may participate via video conferencing. Consequently, no more than one internal member and the external examiner may participate via video conferencing. Under no circumstances can the candidate participate by video conferencing.

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### THESIS DEFENCE PROCEDURE

The final examination for the PhD degree proceeds in three stages:

1. Examination of the candidate's thesis by an internal examining committee.
2. Examination of the candidate's thesis by an external examiner.
3. Oral examination of the candidate by all examiners on the subject of the thesis.

The Oral Examination will be conducted by the Examining Committee plus a representative from the Faculty of Graduate Studies who will serve as Chair. The Oral Examination is open to all members of the University community. See the [Faculty of Graduate Studies PhD Oral Examination Information](#) for details.

A student who receives a failure on either the written thesis or the oral examination twice shall be required to withdraw from the program.

## PROGRAM DURATION

The PhD degree is expected to be completed in four years for full-time students. The maximum time allowed for full-time students is six years. For every two years a PhD student is declared as part time they will receive an additional four months to complete their program. For students who transfer from the MSc to the PhD, time spent in the MSc program is counted toward the PhD program.

## TIMELINE

Mid-July prior to start of term	Register for courses
8 months	Advisory committee appointed
18 months	Thesis proposal approved
24 months	Course requirements complete
2 weeks before candidacy exam	Candidacy document given to advisory committee
30 months	Candidacy exam
minimum 2 months prior to thesis defence recommended 3 months prior to thesis defence	Thesis document submitted to Faculty of Graduate Studies
48 months	Expected completion of PhD degree

## DISPUTES, DISCIPLINARY ACTION, AND APPEALS

### REQUEST FOR TIME EXTENSION

All requests for extensions beyond the maximum time limit will first be considered by GSC, and its recommendation will be forwarded for consideration by the Faculty of Graduate Studies. Normally only one extension will be permitted, for a period of up to, but not exceeding, two years. The Executive Committee of the Faculty of Graduate Studies may require that part-time students being granted extensions enroll full-time during the period of the extension. They may also recommend conditions or remedial work to be associated with the extension. Students must complete the Request for Extension Form, discuss it with their advisor, and submit it with a statement from the advisor to the GSC for recommendation to the Faculty of Graduate Studies. This form must be received by the GSC at least five months prior to the expiration of the time limit and by the Faculty of Graduate Studies at least four months prior to the expiration of the time limit.

### ACADEMIC MISCONDUCT

Plagiarism or any other form of cheating in examinations, term tests or academic work is subject to serious academic penalty (e.g. suspension or expulsion from the faculty or university). To plagiarize is to take ideas or words of another person and pass them off as one's own. Plagiarism applies to any written work, in traditional or electronic format, as well as orally or verbally presented work. Students are expected to appropriately acknowledge the sources of ideas and expressions they use in their written work, whether quoted directly or paraphrased. This applies to diagrams, statistical tables and the like, as well as to written material, and materials or information from Internet sources. To provide adequate and correct documentation is not only an indication of academic honesty but is also a courtesy which enables the reader to consult these sources with ease. Failure to provide appropriate citations constitutes plagiarism.



## APPEALS

Where at all possible, appeals of adverse decisions should be made, in the first instance, at the departmental level. In general, the Department of Computer Science can only recommend a particular action to the FGS with regard to student progress and/or status in the program. In addition, the Department may decide to make no recommendation, in which case the regulations of the FGS would be automatically invoked.