

# Carleton School of Information Technology Graduate Students' Manual

January 1, 2024

<http://grad.csit.carleton.ca/>

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# 1 General Information

## 1.1 Programs

Carleton School of Information Technology (**CSIT**) has the following graduate programs:

- PHD in Information Technology (**PHD** or PHD-IT in this document). This is a thesis-based program and students work with one or more research supervisors.
- Master's in Information Technology, Digital Media (**MDM** in this document). This is a thesis-based program and students work with one or more research supervisors.
- Master's in Information Technology, Digital Media specialization in Data Science (**MDS** in this document). This is a thesis-based program and students work with one or more research supervisors.
- Master's in Information Technology, Network technology (**MNET** in this document). There are two options, a course-based and thesis-based MNET.

More information and details, resources, seminar schedules, etc., can be found online at:

<http://grad.csit.carleton.ca/>

## 1.2 Academic Regulations

We follow standard university regulations (<http://calendar.carleton.ca/grad/gradregulations/>) unless specifically identified.

- For program requirements, see Section 2.
- For thesis requirements, see Section 3.

## 1.3 Registration

- Registration as a full-time student is required for any funding.
- Any student who remains unregistered in their degree program (not taking any courses) for three continuous terms (twelve months) will lose their graduate status.
- Some courses may not finish in one term. These are referred to as “continuing” courses and include:
  - ITEC-5001 (IT Seminar)
  - ITEC-5909 (Master's Thesis)
  - ITEC-6907 (Doctoral Qualifying)
  - ITEC-6908 (PHD Proposal)
  - ITEC-6909 (PHD Thesis)
- Students who register in a continuing course are required to maintain registration in that course for as many terms as necessary (including summer) until the course is passed. For ITEC5001, students only register in the term that they expect to finish the requirements in.

- A grade of B- or better must be obtained in each course credited towards the degree requirements.
  - CSIT students can petition to allow a grade of C+ in 1.0 credits. The School will consider petitions on a **case-by-case basis**.

The following **minimum requirements** must be met before the graduate committee will consider a petition:

- Students must have completed at least 2.5 credits in their program.
- The rest of the grades (all but the course which obtained a C+) must average a CGPA of at least 10.0.

Note that exceptional circumstances will be considered.

To submit a petition, send an email to the graduate administrator that contains your written request for the petition, any information that the committee should consider, your audit and your average CGPA for the rest of your grades.

#### 1.4 Supervision (thesis-based programs)

The Faculty of Graduate and Postgraduate Affairs has outlined the responsibilities & expectations for graduate supervision. <https://gradstudents.carleton.ca/thesis-requirements/graduate-supervision-responsibilities-expectations-policy/>

- Graduate students in programs that include a thesis need to have at least one research supervisor.
  - At least one of the supervisors needs to be a faculty member in CSIT or cross-appointed to CSIT.
  - Adjunct research professors may supervise students according to the terms of their appointments.
- Non-CSIT faculty members can apply for a cross appointment in CSIT to solely supervise graduate students.
- Non-CSIT faculty members can co-supervise with a CSIT faculty member at any time.

#### 1.5 Advising (course-based program)

- Students are assigned an advisor in the admission offer.
- When you start your program, it is your responsibility to contact your advisor. Send them an email with an introduction and discuss courses you will take during your first term as well as your entire program.
- Check in with your advisor once a term.
- Contact your advisor when you need a special permission. Do not wait until the last minute. Forms will not be signed the same day you need to apply, and require several signatures so be sure to **leave at least a week** before the deadline from when you submit your form to gather necessary signatures (Supervisor and ADGS).

## 2 Courses

### 2.1 Program requirement:

- Check requirements at <https://calendar.carleton.ca/grad/gradprograms/informationtechnology/>

### 2.2 Common curriculum

#### 2.2.1 ITEC-5001, Seminar

- ITEC seminar is required for all MDM, MNET and PHD students. To obtain a satisfactory grade, students need to present at least once and attend at least 8 other seminars (totaling 9).
- Attendance:
  - Any student can attend an ITEC seminar, whether they are registered or not.
  - It is the student's responsibility to make sure that their attendance is recorded.
  - If the event is organized by CSIT or a partner group, a sign-in sheet will be available through the event organizer.
  - If the event is independent of CSIT (as may happen occasionally), an attendance form (available through CSIT) must be signed by the event organizer.
  - Attendance will be kept on record until you register for the course.
- Registration:
  - Students should only register in the seminar during the term they expect to fulfill the requirements, or after they have fulfilled the requirements.
  - If requirements are not met, the student may be requested to withdraw from the course or maintain registration (and thus pay the tuition cost).
- Schedule and Content:
  - The seminar schedule is available online: <http://www.csit.carleton.ca/index.php?pageID=GradCurrent>
  - Student presentations are short (~20 minutes, plus Q&A), and multiple students will be scheduled to present for each session.
- Presenting:
  - Students need to contact the Seminar coordinator ([seminar@csit.carleton.ca](mailto:seminar@csit.carleton.ca)) to schedule a presentation.
  - The presentation topic is generally related to students' thesis research. Students are encouraged to present more than once, and if they do so, they may choose other topics of interest.
  - Students are required to submit a title for their presentation, ideally prior to the start of the term at which they are presenting, and no later than 2 weeks before they present.
  - PHD students are encouraged to present annually.
  - No report or other submission is required.
- The seminar schedule will be set by CSIT. They will be during the allocated time shown on the course schedule on Carleton Central.
- Attendance of non-ITEC seminars:
  - Some talks by external guests or other events scheduled for other times may count toward the attendance record. Information will be provided on a case-by-case basis.

- External events require approval *in advance* from the seminar co-ordinator.
- It is the student's responsibility to record their attendance at external events.

### 2.2.2 ITEC-5900, Directed Study

- All graduate students may take Directed Study (DS) as an elective.
- A Directed Study covers topics that are not included in offered courses, or topics that the student intends to work on beyond the coursework.
- The course is not open to anyone by default. In order to register, the following process is required:
  - The student communicates with a faculty member about a topic they are interested in studying, and agree on a subject
    - This faculty member will serve as the DS instructor.
    - DS instructors may be the same as research supervisor or academic advisor.
    - The ITEC-5900 Registration Form will be signed by both student and instructor.
  - The student's research supervisor (or academic advisor for MNET) approves the subject, confirms that it does not overlap significantly with the thesis (or project for MNET), and signs the registration form.
  - The DS instructor sends the course outline and signed form to ADGS.
  - ADGS (or the School Director) approves the course after possible changes to the outline.
  - The student submits a registration error override request.
  - Grad Admin overrides the registration error, allowing the student to take the course.
- To streamline the process, the ITEC-5900 Registration Form must be used and signed by all individuals involved, in proper order.
  - The form can be downloaded from <http://www.csit.carleton.ca/index.php?pageID=GradCurrent> or obtained from the Graduate Administrator.
- A course outline should include:
  - The instructor's name, contact information, term of the course
  - Brief description of the course topic and student activities
  - A statement showing how this subject is not covered by other courses including the student's thesis/project
  - Detailed topics per week
  - Evaluation items with specific deliverables and due dates
- DS can be taken only once. However, DS can count towards another ITEC course that is not offered. In that case, DS can be taken again as an elective on a different subject.
- At the end of the directed studies term, the student will present a 20-min presentation in the seminar series of ITEC-5001. If the student is doing their directed studies in the summer, they must present at the beginning of the fall term Seminar series.

## 3 Theses and Exams

### 3.1 General Information

- A thesis is required to complete MDM, MDS, MNET-thesis and PHD programs at CSIT, and will be prepared individually under the supervision of a CSIT faculty member.
  - Theses can have multiple supervisors and at least one of them must be from CSIT.
- Graduate students are recommended to attend at least one thesis defence by another student (preferably in CSIT, or another school/department at Carleton) prior to theirs, so they are familiar with the format and procedure.
  - According to university regulations, attending a defence requires permission of the student who is defending. Any question from the audience must be submitted to the chair of the examination committee in advance.
  - Students are not permitted to attend other students' proposal defence or qualifying exams.
- PhD and Master's theses must follow specific guidelines and a standard template.
  - The template will be available through the University website and the Graduate Administrator, and will include common structure, format, etc.
    - Abstract, Tables, Intro, Related Work, Conclusion, References, Appendices, etc.
    - Page margins, paragraph formatting, font size, etc.
  - The guidelines include instructions on the content of common chapters, and what is commonly expected. They will be reviewed through regular workshops and made available to students.
  - <http://gradstudents.carleton.ca/thesis-requirements>
  - We specify that a thesis should meet the following requirements:
    - Level of English: Should convey the technical contents well to a broad audience
    - Introduction: Should include a specific problem statement
    - State of the art/Gap analysis: Present an argument which shows conclusively that this work is needed and hasn't been done before
    - The main part of the thesis should clearly show major original contributions to the knowledge in the thesis field
  - It is important that all students are aware of the university's Academic Integrity policy regarding use of generative Artificial Intelligence. Currently, no use of generative AI is permitted.

### 3.2 Master's Thesis (MDM/MDS/MNET)

- Master's theses are expected to show competency in scientific writing and research skills, in addition to novel approaches in digital media technologies, applications, or content.
- The topic of the master's thesis will be determined by the student and supervisor(s). No approval process, or committee selection prior to the defence, is required.
- Registration in the thesis course requires approval of the supervisor.
- Theses are examined by a committee consisting of:
  - Chair person from CSIT
  - One examiner from CSIT
  - One non-CSIT examiner from Carleton University who works in a related field

- Supervisor(s)
- The thesis must be rated as a pass by at least two of the examiners in order to be successful (the chair does not vote).

### 3.3 PhD Qualifying Exam and Thesis Proposal

#### 3.3.1 PhD Qualifying Process

- All PhD students need to pass a set of two exams (or milestones) in order to officially become a PhD Candidate: The Qualifying Exam, and the Proposal Defence.
- The focus of these exams is to show the student is capable of doctoral research, is knowledgeable in the selected field, and has a good plan for their thesis research.
- The qualifying process includes:
  - ITEC-6907, The PhD Qualifying Exam:
    - Students prepare and submit a document focusing on the problem statement, literature review, and gap analysis.
    - Students defend their submission in an oral exam including questions from examiners, but no presentation is given. Students are expected to understand the literature in their review as well as the academic context in which that literature was written. See Appendix A
  - ITEC-6908, Proposal Defence:
    - Students prepare and submit a written proposal focusing on a literature review that is contextualized to their specific topic, a detailed idea/solution, and early results. See the Proposal Guidelines and Appendix B for further information.
    - Students defend their proposal in an oral exam including presentation and questions from examiners
- ITEC-6907 is a prerequisite for ITEC-6908: The Qualifying Exam must be successfully completed by the end of the 3<sup>rd</sup> term (see below).
- ITEC-6908 is a prerequisite for ITEC-6909: The Proposal Defence must be successfully completed by the end of the third year of full-time studies, and should ideally be completed by the end of their second year (see below).<sup>1</sup>

#### 3.3.2 Qualifying Exam

- Supervisors will NOT help the students in any way, this will be treated as an exam.
- The purpose of this exam is to:
  1. Assess the students' ability to do research
  2. Serve as a starting point for the PhD literature survey and selection of a research topic
- The PhD Qualifying Exam should be completed in three terms. If the student fails the 1st attempt, they have one more try in the 4th term.
- Students who fail this exam twice will be withdrawn from the PhD program. Students who do not successfully complete either the Qualifying Exam or Proposal of their PhD degree may, with permission of their supervisor and the Associate Director of Graduate Studies, apply to the

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<sup>1</sup> Students admitted prior to September 2023 may have a different limit for ITEC-6907/6908.



Master's program with advanced standing toward a Master of IT in either digital media or network technology, depending on the student's topic area. All courses completed during their PhD studies will count towards this Master's degree.

- The deadline to pass the qualifying exam in a term is the last day of exams (as set by the graduate calendar).
- Any term since admission counts towards this limit but LOA (Leave Of Absence) does not count.
- The detailed process of the qualifying exam process is set in Appendix A

### 3.3.3 Proposal Defence (ITEC 6908)

- See the Proposal Guidelines and Appendix B on the Current Graduate Students web page for guidance on length and formatting.
- The Exam Committee for the proposal defence is typically the same as that of the Qualifying Exam. If there are changes, the supervisor must submit a justification to the ADGS on why the change is needed.
- Students can retake the Proposal Defence once. Those who fail this exam twice will be withdrawn from the program.
  - Students **must** complete ITEC-6908 by the end of their 3<sup>rd</sup> year. It is **recommended** that students complete the Proposal **by the start of your third year**.
  - In **exceptional circumstances**, students may request up to two (2) terms of extension for their proposal. These circumstances must be detailed in an extension request form, along with a detailed plan of how to achieve the milestone. A clear justification must be provided by the student for this extension request.
    - The first term request must be approved by the ADGS or School Director.
    - The second term request must be approved by the graduate committee.
- The submitted document is expected to build on a proper literature review (similar to what was done for Qualifying Exam) but focus on proposing a clear solution and research plan, and show early results that can convince the committee of the value of the proposed research and feasibility of the plan. Early work should include at least one completed research pilot project/study. Many graduate students will have submitted this early work for peer-review (or even have the work accepted/published). However, if a peer-reviewed submission has not happened yet, the work should still be of sufficiently high quality to be adequate for a publication.
- The proposal document must be submitted **at least 3 weeks prior** to the oral exam.
- The **deadline to pass the thesis proposal in a term** is the last day for graduate students to upload their final thesis copy to graduate in a term (as set by the graduate calendar). Exams should, however, be undertaken well before that deadline except in exceptional circumstances.
- The detailed process of the Proposal Exam process is set in Appendix B

### 3.4 PhD Thesis

- PhD theses are expected to show excellence in scientific writing and research skills, in addition to novel theoretical frameworks and approaches in digital media technologies, applications, or content. The primary achievement should be an original contribution to knowledge, and this contribution should be justifiable, defensible, and contextualized within the field to show its originality.
- PhD theses must follow specific guidelines and a standard template, similar to Master's theses, as set out by Carleton University (<https://gradstudents.carleton.ca/resources-page/thesis-requirements/>).
- PhD theses are examined by the Thesis Committee:
  - The Chair of the committee will be assigned by the school, and will not be a voting member of the examination.
  - Another CSIT faculty member must be added to the committee from the Proposal Exam. If there are changes, the supervisor must submit justification to the ADGS on why the change is needed.
  - One external examiner must be added to the proposal committee, who is not from Carleton University.
  - <http://gradstudents.carleton.ca/wp-content/uploads/Thesis-Examination-Policy-Revised-February-2016.pdf>

### 3.5 PhD exam set up

- The candidate informs the thesis supervisor of the date they intend to submit the thesis. **This notice shall be given at least two weeks in advance of the submission date.**
- The supervisor is to provide the following to the ADGS:
  - A committee members list that includes a proposed external examiner.
  - A short justification of why the external examiner is an authority in the field. While not being a strict requirement, the external examiner is expected to have graduated at least one PhD student.
  - A statement that there is no conflict of interest between the external and the supervisor, and the external and the student.
  - Please note that there should be **no contact** between the student and defence committee regarding the thesis.
- Following approval of the committee by the ADGS, the supervisor formalizes the date, then submits the online form on final PhD exams (found at the bottom of the page <https://www.csit.carleton.ca/index.php?pageID=GradCurrent>) to the admin assistant to schedule the exam room and find a chair.
- The candidate must submit their final draft of the thesis **to their supervisor at least eight weeks** before the date of the examination, and must upload an examination copy **through Carleton Central six weeks** before the actual date of the examination of the thesis

## 4 Timeline

While graduate students do not have a fixed timeline, some general guidelines and requirements exist.

- Full-time MDM/MDS/MNET studies will have a nominal duration of 6 terms (2 academic years).
  - The first 2 terms are usually for coursework.
    - By the end of these 2 terms, students are expected to have a good idea of their research topic.
  - The next 3 terms are usually spent on the research.
  - The 6<sup>th</sup> term is generally for writing up the thesis and doing the defence, although this can be done in the 5<sup>th</sup> term too. Finishing in fewer than 5 terms is not likely.
- Full-time PhD studies will have a maximum duration of 6 academic years. They are encouraged to finish earlier than that.
- Graduate students who are registered in thesis/qualifying/proposal will have to continue registering in the course until successful completion.
- Leaves of absence or starting as part-time studies will affect the calendar duration.
  - Part-time students and those on leave will not receive funding (TAships or scholarships).
- Extension to the above deadlines requires permission of the supervisor and ADGS.

## 5 Appendix A (Qualifying Exam Process and Evaluation)

### Step 1

The supervisor(s) initiates the process by establishing a general topic for the literature review and providing a list of 10 relevant papers. It is the supervisors' responsibility to invite two examiners: at least one internal to CSIT, and one ideally external to CSIT. During the oral exam there will also be a chairperson, who does not have a vote.

#### Committee selection

- 1 Supervisor identifies examiners
2. Supervisor invites examiners
3. Supervisor informs ADGS of the two invited examiners.
4. ADGS verifies list of examiners, potentially sending the process back to step 1 (and requiring invitations to be rescinded).

In consultation with the examiners, the supervisor(s) will extend the list by an additional 20 relevant papers, for a total of 30 papers. The supervisor(s) will verify that all included papers have sufficient quality. Supervisors must submit to the graduate admin and the ADGS the chosen topic and the verified list of papers on or before the last day to register for the student's second term. These papers will form the basis of the student's work for the Ph.D. Qualifying Exam.

Supervisors must submit to the graduate admin and the ADGS the chosen topic and the verified list of papers **on or before the last day to register for the student's second term.**

### Step 2

The student prepares a report which should provide a **critical review** based on the papers provided, in a way that meets the expectations listed below. The student can include other cited work, but is limited to 10 additional papers. The reference list should clearly identify which papers were from the provided list, and which were added by the student. In a separate section, the student should provide a bullet-form justification, where the reason for including each additional paper is explained in a single bullet point.

#### **Task and expectations**

The student writes a report on the topic chosen in Step 1 based on the given 30 research papers. The report includes:

- Clear categories of the main challenges in the topic's research area (i.e. what are the key themes, the key approaches, and the key solutions in the research area, and where do they fall short?)
- Clear categories of the current solutions/methodologies that address each of the current challenges and how the authors address them

- Based on these categories, the student identifies gaps in the research area (what questions remain unanswered? Or what approaches/methods may offer alternative solutions or alternative answers to a problem?). This item is a critical part of the report.

The student is:

- not asked to find new solutions.
- not asked to create a report that is suitable for submission for publications. We are not preventing publication, but it is not a requirement.
- The document will be limited to a maximum of 10,000 words, excluding references.
- responsible for providing proper grammar and spelling checking of the document, through a proper professional service if needed. This support must be limited to spelling and grammar correction, and any use of support must be acknowledged.

What is not acceptable:

- A sequential summary of papers (paper 1 summary, paper 2 summary,...).
- Joint work with anyone (including other students) in any form. The document will be solely the work of the student. The use of any form of artificial intelligence to write the report is not permitted.
- Failure to acknowledge existing survey papers in the area and pointing out how the presented document is not a copy of these papers.
- The reviewed work should not include anything by the students themselves, e.g., Descriptions of experiments that the student has designed or completed

### Step 3: Exam setup process

At the beginning of the third semester, the supervisors initiate the exam setup process by setting a date before the student submits the document to the CSIT Grad Administrator. The student will submit the report to the CSIT Graduate Administrator NO LATER THAN three weeks from the last day of classes.

The CSIT Grad Administrator will send the document to all committee members, at the same time. This will start the clock for two weeks (or more) from the oral exam. The school will also deliver all rules to the examiners so that they are aware of what grading options are available.

### **Evaluation**

The exam consists of two parts: An oral exam, and the written document. The examiners will assess the written document in advance of the oral exam.

The student will be allowed to progress to the Oral Exam regardless of the result of the written document assessment.

The written document assessment does not need to be sent to the chair, but will be shared by the examiners within the committee during the oral exam.

The committee will decide to pass/fail the student based on the combined assessment of the document and the oral exam. Each committee member (supervisor(s), internal and other examiner) have one vote. If there is more than one supervisor, the supervisors together will have one vote, for a total of 3 votes. A majority vote is needed to pass.

The student will be notified of a pass/fail. If the student fails the exam the first try, they will have one more opportunity to pass the exam.

## Appendix B (Proposal Exam Process and Evaluation)

### **Step 1: Write the proposal**

The purpose of the PhD Proposal is to define your research question(s) and demonstrate that you

- 1) understand the field and how your work is contextualized in that field.
- 2) Have defined a clear research question to answer.
- 3) Have define a clear, achievable plan to answer that research question.

For guidance on length and structure of your proposal, see the Guidelines on the CSIT graduate students website (<https://www.csit.carleton.ca/index.php?pageID=GradCurrent> ) The document should be about 10,000 words, excluding references or appendices, which may included student's published paper(s) if applicable.

### **Step 2 Exam setup process**

After writing your proposal, the proposal exam must be scheduled. Normally, your committee will remain the same as for your Qualifying Exam. However, there must be an examiner external to CSIT for the proposal defence.

The committee membership may also be changed with justification by the supervisor and permission of the ADGS.

The supervisor(s) will chair the examination in the proposal defense, as it is assumed that the supervisor has read and accepted the proposal already. If the supervisor does not approve the proposal and the student chooses to go ahead anyway, the supervisor may choose to make that fact known to the examiners. The two examiners will each get one vote for the written and oral defence. In the case of a disagreement between the two examiners, the examiners will attempt to reach a consensus. In the rare case of a lack of consensus, the external examiner will have the deciding vote.

The supervisor should make clear to the external examiner our department expectations for a thesis proposal (see the Guidelines).

The student submits the Thesis Proposal in Carleton Central by the deadline. Typically the supervisor will also email a copy to the examiners.

### **Evaluation**

The exam consists of two parts: An oral exam, and the written document. The examiners will assess the written document in advance of the oral exam.

The student will be allowed to progress to the Oral Exam regardless of the result of the written document assessment.

The written document assessment will be shared by the examiners within the committee during the oral exam.

The committee will decide to pass/fail the student based on the combined assessment of the document and the oral exam.

The student will be notified of a pass/fail. If the student fails the exam the first try, they will have one more opportunity to pass the exam.