Carleton School of Information Technology Graduate Students' Manual

Version 3

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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, Network technology (**MNET** in this document). This is a course-based program and students have an academic advisor.

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 full-time student is required for any funding.
- Any student who remains unregistered in his/her degree program (not taking any courses) for three continuous terms (twelve months) will lose his/her graduate status.
- Some courses may not finish in one term. These are referred to as "continuing" courses and include:
    - ITEC-5001 (IT Seminar)
    - ITEC-5905 (MNET Project)
    - ITEC-5909 (MDM Thesis)
    - ITEC-6907 (PHD Comprehensive Exam)
    - 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.

2 Courses

2.1 Program requirements:

- MASTER's in NETWORKING (MNET)
    - ITEC 5000 [0.5 credit] Analytical Methods for Information Technology
    - 2.0 credits in ITEC 510X courses

    - ITEC 5905 [1.0 credit] Network Technology Project
    - ITEC 5001 [0.0 credit] Information Technology Seminars
    - 1.5 credits of electives (which may include other ITEC courses) selected with consultation of their supervisor.
- MASTER'S in DIGITAL MEDIA (MDM)
    - ITEC 5000 [0.5 credit] Analytical Methods for Information Technology
    - 1.5 credits in ITEC 52XX courses
    - 0.5 credits in Electives (which may include other ITEC courses) selected in consultation with the supervisor
    - ITEC 5001 [0.0 credits] Information Technology Seminar
    - ITEC 5909 [2.5 credits] Master's Thesis in Digital Media
- PHD in INFORMATION TECHNOLOGY, DIGITAL MEDIA (PHD)
    - ITEC 6200 [0.5 credit] Interdisciplinary Research on Digital Media
    - 1.0 credit in Electives selected in consultation with the supervisor
    - ITEC 5001 [0.0 credit] Information Technology Seminar
    - ITEC 6907 [0.0 credit] Doctoral Comprehensive
    - ITEC 6908 [0.0 credit] Doctoral Proposal
    - ITEC 6909 [8.5 credits] Doctoral Thesis in Digital Media

2.2 Common curriculum

2.2.1 ITEC-5000

Topics for ITEC-5000 will generally include the following (changes are possible in each offering):

- Information Systems
    - Computer Architecture
    - Networks
    - Operating Systems
- Software Programming
    - Programing Languages
    - Algorithmic Thinking
    - Algorithm Design
    - Data Structures
- Software Engineering
    - Life Cycles Models
    - System Analysis and Requirement Management
    - Software Verification and Validation, User Evaluation, and Experimentation
    - Statistical Data Analysis

2.2.2 ITEC-5001, Seminar

- ITEC Seminars are presented by students, faculty, invited speakers, etc.
    - Occasionally external events may count toward ITEC-5001. Information will be provided in such cases.
- ITEC seminar is required for all graduate students. They have to attend at least 8 seminars and present at least once in order to pass the course.
    - Seminar is a continuing course (see Section 1.3).
    - The students can register in Seminar at the term they expect to fulfil the requirements, or after they have done so.

        - If requirements are not met, the student needs to maintain registration.
        - Partial attendance will be kept on record for next registration
    - The seminar requirements can be fulfilled throughout the program.
    - No report or other submission is required except for presentation material.
    - Students need to contact the Associate Director of Grad Studies (ADGS, adgs@csit.carleton.ca) to schedule a presentation.
    - The students have to make sure that their attendance is recorded.
        - If the event is organized by CSIT or a partner group, a signing sheet will be available through event organizer.
        - If the event is independent of CSIT (as it may happen occasionally), an attendance form (available through CSIT) has to be signed by the event organizer.
- Seminars schedule will be set by the Graduate Committee. They will be during the allocated time shown on student's weekly schedule on Carleton Central.
    - Some talks by externals guests or other events scheduled for other times may count toward. Information will be provided to students on a case by case basis.
- It is estimated that we will have one external speaker and 2 student presentation sessions per month, during the fall and winter terms. One week per month is allocated for special workshops (presentation by faculty).
    - Student presentations are short (10-15 minutes, plus QA), and multiple students will be scheduled to present for each session.
    - The topic of presentation is generally related to student's 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 an abstract for their presentation, ideally prior to the start of the term at which they are presenting, and no later than 6 weeks into the term.
- Seminar Schedule will be available online: http://grad.csit.carleton.ca/

2.2.3 ITEC-5900, Directed Study

- All PhD, MDM, and MNET students may take Directed Study (DS) as an elective.
- A Directed Study covers topics that are not included in offered courses, or topics that 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:
    - Student communicates with a potential DS instructor and agree on a subject.
        - DS instructors may be the same as research supervisor (or academic advisor for MNET).
    - Student's research supervisor (or academic advisor for MNET) will approve the subject through email to ADGS, and confirms that it does not overlap significantly with the thesis (or project for MNET).
    - Student submits a Registration Error Override Request through online registration system.
    - DS instructor sends the course outline to ADGS.

    - ADGS approves the course after possible changes to the outline.
    - Grad Admin overrides the registration error, allowing the student to take the course.
- A course outline should include:
    - Brief description of the course topic and student activities
    - A statement showing how this subject is not covered by other courses including thesis/project
    - Detailed topics per week
    - Evaluation items with specific deliverables and due dates
- DS can be taken only once.
    - 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.

2.2.4 ITEC-5905, MNET Project

- All MNET students are required to take the project course.
- The process for registering in ITEC-5905 is similar to the process for ITEC-5900 (see Section 2.2.3 above).
- MNET Project is a continuing course and may take more than one term to finish (see Section 1.3).

2.3 Course offering

The currently approved ITEC courses are:

- ITEC 6200 [0.5 credit] Interdisciplinary Research on Digital Media
- ITEC 5000 [0.5 credit] Analytical Methods for Information Technology
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- ITEC 5100 [0.5 credit] Planning and Design of Computer Networks
- ITEC 5101 [0.5 credit] Cross Layer Design for Wireless Multimedia Networks
- ITEC 5102 [0.5 credit] Designing Secure Networking and Computer Systems
- ITEC 5103 [0.5 credit] Cloud and Datacenter Networking
- ITEC 5110/NET4000 [0.5 credit] Emerging Network Technologies
- ITEC 5111/NET4007 [0.5 credit] Multimedia Networking
- ITEC 5112/NET4010 [0.5 credit] Secure Mobile Networking
- ITEC 5113/NET4001 [0.5 credit] Network Simulation
- ITEC 5114/NET4005 [0.5 credit] Networked Applications
- ITEC5900 [0.5 credit] Directed Study
- ITEC 5910 [0.5 credit] Selected Topics in Network Technologies
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- ITEC5200 [0.5 credit] Entertainment Technologies
- ITEC5201 [0.5 credit] Computer Animation Technologies
- ITEC5202 [0.5 credit] Visual Effects Technologies
- ITEC5203 [0.5 credit] Game Design and Development Technologies
- ITEC5204/HCIN5300 [0.5 credit] Emerging Interaction Techniques
- ITEC 5900 [0.5 credit] Directed Studies
- ITEC 5920 [0.5 credit] Selected Topics in Digital Media

New courses will be approved and added to increase the options and expand the areas in the respective programs. For example, the faculty members associated with the new IRM program are expected to create new courses for MDM program.

The Graduate Committee will determine the course offering.

ITEC-5000 is expected to be offered every year and in Fall term.

ITEC-6200 is expected to be offered every year and in Fall term (or every other year, depending on the enrolment).

3 Theses and Exams

3.1 General Information

- A thesis is required to complete MDM and PHD programs at CSIT, and will be prepared individually under the supervision of a CSIT faculty members.
    - Theses can have multiple supervisors and at least one of them must be from CSIT.
    - MNET program does not include a thesis but has a final project that will be coordinated with an assigned advisor.
- 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 students who is defending. Any question from audience has to be submitted to the chair of examination committee in advance.
- PhD and Master's theses have to follow the guidelines and a standard template.
    - The template will be available through 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

3.2 Supervision

- Graduate students in programs that include a thesis (PHD and MDM) need to have at least one research supervisor.
    - At least one of the supervisors need to be full-time CSIT faculty member.
    - Adjunct and cross appointed professors may supervise students according to the terms of their appointments (only Masters level, etc).
- Non-CSIT faculty members can apply for a cross appointment in CSIT in order to solely supervise graduate students.
- Non-CSIT faculty members can co-supervise with a CSIT faculty member at any time.

    - Non-CSIT co-supervision is strongly recommended (but not required) for PhD students due to the interdisciplinary nature of the program. Such co-supervisors is expected to be from complementary research areas.
- MNET students will do a project instead of thesis research, and will have a CSIT faculty member assigned as advisor.

3.3 Master's Thesis

- MDM 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 MDM theses will be determined by the student and supervisor(s). No approval process, or committee selection prior to the defence, is required.
- Registration in MDM thesis requires approval of the supervisor.
- MDM theses are examined by a committee consisting of:
    - Chair who can be any CSIT faculty
    - One examiner from CSIT
    - One non-CSIT examiner from Carleton University who works in a related field
    - Supervisor(s)
    - http://gradstudents.carleton.ca/wp-content/uploads/Thesis-Examination-Policy-Revised-22-April-2014.pdf

3.4 PhD Comprehensive Exams and Thesis Proposal

3.4.1 PhD Qualifying Process

- All PhD students need to pass a set of two qualifying exams (or milestones) in order to officially become a PhD Candidate.
- The focus of qualifying exams is to show the student is capable of doctoral research and has a good plan for his/her thesis research.
- The qualifying exams include:
    - ITEC-6907, Comprehensive Exam:
        - Students prepare and submit a document focusing on problem statement, literature review, and initial idea/solution.
        - Students defend their submission in an oral exam
    - ITEC-6908, Proposal Defense:
        - Students prepare and submit a written proposal focusing on updated literature review, detailed idea/solution, and early results.
        - Students defend their proposal in an oral exam
- These two qualifying exams are expected to be done one after another, and prior to entering the 3rd and 4th years of full time studies, respectively.
- The qualifying exams will include a committee consisting of:
    - Chair who can be from any school or department at Carleton University
    - One examiner from CSIT
    - One non-CSIT examiner from Carleton University who works in a related field
    - Supervisor(s)

3.4.2 Comprehensive Exam

3.4.2.1 Regulations

- The comprehensive exam should be taken in the first or second year of the PhD studies.
- The examination committee consists of supervisor(s), an examiner from CSIT, an examiner from Carleton but not CSIT, a chairperson from CSIT.
- The subject area of the examination and the committee members will be decided by the student and supervisor(s), and approved by the Associate Director of Graduate Studies.
- The exam includes a written document (expected about 25-30 pages in typical thesis format) submitted to the committee, followed by an oral defence.
    - The document must be submitted at least 2 weeks prior to the oral exam.
- The exam will be graded as Satisfactory or Not-satisfactory.
    - ITEC-6907 is pre-requisite for ITEC-6908.
    - ITEC-6908 is pre-requisite for ITEC-6909.
- Students can re-take any of the Comprehensive Exams once. Those who fail this exam twice will have to withdraw from the program.

3.4.2.2 Submission

- Abstract
- Introduction
    - Introduction to the field of study.
    - Background, motivation, significance, stake-holders, etc, will be discussed here
    - Identifying the main goals and objectives
        - Here we understand what the systems/products/theories involved in this document are trying to achieve
    - This can be the basis for evaluation criteria
- Review of existing work that try to achieve the above goals
    - Grouping and structuring of these approaches to find patterns and commonalities
    - Critical analysis to find strengths and weaknesses, and gaps in the current knowledge
        - This analysis should be based on the goals listed above and using proper evaluation criteria
- Identifying and reviewing related subjects if applicable, for example
    - Those from other fields that can be applied here to solve the above problems
    - Not directly related but similar or high-level subjects
- Detailed conclusion
    - Summary of existing problems
    - Hint to possible solutions (basis of thesis proposal)
- References

3.4.3 Proposal Defence

Regulations for Proposal Defence are similar to Comprehensive Exam.

- It should be taken no later than the third year of PhD studies.
- It may have a different subject than the Comprehensive Exam.

The submitted document is expected to build on a proper literature review (similar to what was done for Comprehensive 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.

3.5 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.
- Thesis Committee formed at the proposal time will continue to function in an advisory role until the student has graduated.
- PhD theses have to follow the guidelines and a standard template, similar to Master's theses.
- PhD theses are examined by the Thesis Committee
    - Chair of the committee will be assigned by FGPA
    - Another CSIT faculty member needs to be added
    - One external examiner needs to be added who is not from Carleton University
    - http://gradstudents.carleton.ca/wp-content/uploads/Thesis-Examination-Policy-Revised-February-2016.pdf

4 Timeline

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

- Full-time M-NET studies will have a nominal duration of 5 terms.
    - The first 3 terms are usually for coursework and 1 or 2 more terms for project.
- Full-time M-DM 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 good idea of their research topic.
    - The next 3 terms are usually spent on the research.
    - The 6th term is generally for writing up the thesis and doing the defence. Although this can be done in the 5th term too. Finishing in less than 5 terms is not likely.
- Full-time PhD studies will have a nominal duration of 12 terms (4 academic years).
    - The students are expected to finish their coursework in the first 3 or 4 terms (by the middle of 2nd academic year).
    - The recommended pattern is to do the comprehensive exam and proposal defence by the end of 2nd and 3rd academic year of full-term studies.
- PhD students register in ITEC-6907 and ITEC-6908 for the terms at which they plan to do the comprehensive exam and proposal defence.
- Graduate students who are registered in thesis/project, will have to continue registering in the course until successful completion.
- Leaves of absence or part-time studies will affect the calendar duration.
    - Part-time students and those on leave will not receive funding.
- Extension to the above durations requires permission.