Memorial University of Newfoundland

Master of Science in Computer Science

CURRICULUM

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Programs

Option 1 - Thesis Route

1. Students are required to complete a minimum of 15 credit hours in graduate program courses, 9 credit hours which are Computer Science courses as follows: COMP 690A/B and 6 additional credit hours in Computer Science (excluding COMP 601W and COMP 6999).
2. Full-time students are expected to complete their course work within their first year of studies. Part-time students are expected to complete their course work by the end of the seventh semester in their program.
3. Students must participate in the Research Forum at least once during their program. The Student Research Forum is organized by the Department of Computer Science and takes place each academic year.
4. Each student is required to submit an acceptable thesis. The thesis project may involve a theoretical investigation and/or the development of an original, practical system. Each student is required to present a tentative outline of the student's proposed research to the Supervisor, with a copy to the Department Committee on Graduate Studies, by the end of the student's third semester in the program (sixth semester for part-time students). A fifteen minute oral presentation of the proposal is to be scheduled and given within four weeks of the submission date.
5. Prior to submission of a thesis, normally in the last semester of the program, students are required to present a seminar on the thesis topic, methods employed, and research results.

Option 2 - Course-based Route

1. Students are required to complete a minimum of 30 credit hours in graduate program courses, of which at least 21 credit hours must be in Computer Science, whereas the remaining 9 could be Computer Science courses, other courses related to computer science and included in the list of Computer Science approved elective courses maintained by the Graduate Studies Committee, available at www.mun.ca/computerscience/graduate-students, or other courses previously approved by the Graduate Studies Committee, or its Chair.
2. Within the 30 credit hours requirement, students must take COMP 6999 (Master's Project).
3. Prior to graduation and as part of successfully completing COMP 6999, students are required to present a seminar on their project.

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Option 3 - Work Term Route

The work term route provides an opportunity for graduate computer science students to learn valuable practical skills while working in fields related to computer science. Students complete a full-time, paid work term (COMP 601W) of four or eight months with a single employer as an essential component of their academic program. There is no direct entry into this program. Students may apply for admission into Option 3-Work Term Route towards the end of their first semester in Option 1 – Thesis Route or Option 2 – Course-based Route.

1. **Admission Requirements**
    a. Admission to the work term route is limited, competitive, and selective.
    b. The primary criteria used in reaching decisions on applications for admission is academic performance, relevant experience and motivation. Students may be required to participate in an interview as part of the selection process.
    c. Applications are accepted each semester, approximately 4-5 months in advance of start of the work term. Students are informed of application deadlines by the Department of Computer Science.
    d. Students must have completed 12 credit hours of program courses prior to the start of the work term. Students must have at least one required course remaining after the work term.
2. **Program of Study**
    a. Students are required to complete a minimum of 24 credit hours in graduate program courses, of which at least 18 credit hours must be in Computer Science, whereas the remaining 6 should be either in Computer Science, related to computer science and included in the list of elective courses maintained by the Graduate Studies Committee, or previously approved by the Graduate Studies Committee, or its Chair.
    b. Within this credit requirement, a student must take the following courses:
        i. COMP 6999 (Master's Project)
        ii. One course in Software Engineering (COMP 6905)
        iii. One course in Algorithms (COMP 6901, COMP 6902, or COMP 6981)

c. Additionally, students are required to complete one co-operative education work term (COMP 601W). The work term is a full-time, four- or eight-months duration paid work experience with one employer.
d. The work term job search takes place throughout the semester prior to the start of the intended work term. Students who are not successful in securing a work term job in their first search semester may continue their search for up to two additional semesters.
e. Prior to graduation and as part of successfully completing COMP 6999 (Master's Project), students are required to present a seminar on their project.

3. **Work Term**
   a. Students will conduct job searches with an Academic Staff Member in Co-operative Education in cooperation with the Department of Computer Science. It is the student's responsibility to seek and obtain a work term placement and to communicate with all parties both within the University and beyond in a professional manner. While the student's job search is supported by the Academic Staff Member in Co-operative Education, it is the student's responsibility to secure a work term placement. Work term placements are not guaranteed. Work term placements obtained outside the job competition must be confirmed by letter from the employer and approved by an Academic Staff Member in Co-operative Education on or before the first day of the work term.
   b. Work terms start in January, May and September; the start and end dates are available at www.mun.ca/coop.
   c. Each work term placement will be supervised by the student's on-site workplace supervisor and the Academic Staff Member in Co-operative Education. The overall evaluation of the work term is the responsibility of the Academic Staff Member in Co-operative Education. The work term shall consist of two components:
      i. On-the-job Student Performance as evaluated by the workplace supervisor and the Academic Staff Member in Co-operative Education.
      ii. Assignment(s) graded by the Academic Staff Member in Co-operative Education.

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Other Regulations

1. Students from either **Option 1 - Thesis Route** or **Option 2 - Course-based Route** may request to transfer to a different route once during their studies, after completing 4 courses (12 credit hours) in their original program upon admission to the School of Graduate Studies at this University.
2. All students are expected to take an active part in seminars and other aspects of the academic life of the Department of Computer Science.
3. 3. Unless the work-term takes longer than one term, full-time students are expected to complete all program requirements in two years. Part-time students are expected to complete all program requirements in four years.

Courses

A selection of the following graduate courses will be offered to meet the requirements of students, as far as the resources of the Department will allow. Normally, students will be expected to complete their course work during the Fall and Winter semesters.

- 601W Work Term
- 6758-6769 Special Topics in Computer Applications
- 6770-6790 Special Topics in Computer Science
- 690A/B Research Methods in Computer Science
- 6901 Applied Algorithms *(credit restricted with 6783)*
- 6902 Computational Complexity *(credit restricted with 6743)*
- 6903 Concurrent Computing
- 6904 Advanced Computer Architecture *(credit restricted with 6722)*
- 6905 Software Engineering *(credit restricted with 6713)*
- 6906 Numerical Methods *(credit restricted with 6731)*
- 6907 Data Mining Techniques and Methodologies *(credit restricted with 6762)*
- 6908 Database Technology and Applications *(credit restricted with 6751)*
- 6909 Fundamentals of Computer Graphics *(credit restricted with 6752)*
- 6910 Services Computing, Semantic Web and Cloud Computing
- 6911 Bio-inspired Computing
- 6912 Autonomous Robotics *(credit restricted with 6778)*
- 6913 Bioinformatics
- 6914 3D Modelling and Rendering
- 6915 Machine Learning

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- 6916 Security and Privacy
- 6918 Digital Image Processing *(credit restricted with 6756)*
- 6921 Syntax and Semantics of Programming Languages *(credit restricted with 6711)*
- 6922 Compiling Methods *(credit restricted with 6712)*
- 6924 Formal Grammars, Automata and Languages
- 6925 Advanced Operating Systems
- 6926 Performance Evaluation of Computer Systems *(credit restricted with 6926)*
- 6928 Knowledge-Based Systems *(credit restricted with 6755)*
- 6929 Advanced Computational Geometry *(credit restricted with 6745)*
- 6930 Theory of Databases *(credit restricted with 6742)*
- 6931 Matrix Computations and Applications *(credit restricted with 6732)*
- 6932 Matrix Computations in Control *(credit restricted with 6738)*
- 6933 Nonlinear and Linear Optimization *(cross-listed with Mathematics 6202)*
- 6934 Introduction to Data Visualization *(credit restricted with 6774)*
- 6980-6998 Special Topics in Computer Science
- 6999 Master's Project