

# ELECTRICAL AND COMPUTER ENGINEERING

## Programs of Study

### Master's Degrees

#### Master of Applied Science (M.A.Sc.)

This is a thesis/research based Master's program. The minimum requirements are a research thesis, a seminar course, and 4 term-length graduate-level courses, of which two courses must be selected from graduate courses offered by the Department of Electrical and Computer Engineering.

One term length senior (400-series) undergraduate course, OR one combined undergraduate/graduate course (also known as a double numbered 400/800 course) may be accepted as the equivalent of a graduate course from any discipline for an M.A.Sc. student provided that

- a) the course is approved by the student's supervisor and
- b) the student has not received credit for a similar course in their Bachelor's program.

All students must attend department seminars to complete ELEC 891, the mandatory seminar series course. The requirements are set at the Department's discretion according to the student's background.

The supervisor(s) and department must approve all programs of study.

#### Master of Applied Science (M.A.Sc.) with a Field of Study in Artificial Intelligence

This is a thesis/research based Master's program with a Field of Study in Artificial Intelligence. The minimum requirements of the Field of Study in Artificial Intelligence are:

- Take a minimum of two courses from the list of AI-related courses, including ELEC 825
- Take up to two more graduate-only courses as required in the MASc program
- Complete an AI-related MASc thesis
- Complete other requirements including taking the graduate seminar course and the non-credit AI Ethics and Society course

List of AI-related courses:

- ELEC 823 Signal Processing
- ELEC 825 Machine Learning and Deep Learning
- ELEC 874 Computer Vision
- ELEC 879 Wearable and IoT Computing
- ELEC 880 Machine Learning for Natural Language Processing

The student must attend departmental seminars to complete ELEC 891, the mandatory seminar series course.

The requirements are set at the Department's discretion according to the student's background.

The supervisor(s) and department must approve all programs of study.

#### Master of Engineering (M.Eng.) (Non-Thesis Option)

The requirements for this program are 8 term length courses. At least 4 term length courses must be taken from the Department of Electrical and Computer Engineering and be entered as primary on the registration form. A maximum of 2 term length 400 series undergraduate courses or double number 400/800 level courses or a combination thereof may be taken provided that:

- a) the courses are approved by the student's supervisor or graduate coordinator and
- b) the student has not received credit for similar courses in their Bachelor's program.

When:

- a) 2 term-length 400 series undergraduate courses,
- b) one 400 series undergraduate and one double number 400/800 graduate level courses, or
- c) two double number 400/800 graduate level courses are taken,

the remaining courses must be graduate level courses and must not be combined undergraduate/graduate courses (also known as a double numbered 400/800 graduate level courses).

All the course selections must be approved by the Department.

These courses must be selected as follows:

1. Four term-length graduate courses must be courses offered in the Department.
2. Two of the courses in (1) may be replaced by ELEC 898-M.Eng. Project.
3. Normally, the remaining courses may be chosen from courses listed by the Department, or from courses offered by another department in Queen's University, or from Royal Military College.
4. The student must select at least one course that contains a project if not selecting the project course ELEC 898. A list of courses containing a project is maintained by the department.



Students must also take the non-credit seminar course ELEC 891.

### **Master of Engineering (M.Eng.) with Industrial Internship field**

The M.Eng. with Industrial Internship field in Electrical and Computer Engineering requires students to take six term-length lecture-based courses, up to two of which can be fourth-year undergraduate courses. In addition, internship students take two term-length internship project courses (ELEC 895 and ELEC 896), for a total of eight courses. Students must also take the non-credit seminar course ELEC 891.

Further, the courses must be selected as follows:

1. ELEC 895 and ELEC 896;
2. At least two term-length graduate courses must be courses offered in the Department;
3. Normally, the remaining lecture-based courses may be chosen from courses listed by the Department, or from courses offered by another department in Queen's University, or from the Royal Military College.

If a student decides not to take ELEC 896, then they must take a total of seven term length lecture-based courses. This situation could arise for example if the duration of the internship job was only 4 months.

### **Doctor of Philosophy (Ph.D.)**

During the first term, the Department in consultation with the student's supervisor(s) establish an Internal Thesis Committee consisting of the supervisor(s), an internal examiner, as well as a department representative. At this time, an area of research is chosen. The internal examiner should have expertise close to the candidate's general research area. The requirements to be fulfilled include a minimum of 4 term-length graduate courses beyond the Master's degree, a two-part comprehensive examination, the seminar course ELEC 891, satisfactory research progress and a thesis.

One of the graduate courses must be taken from outside the Department. One of the graduate courses must be taken inside the Department. Only 1 course may be a combined undergraduate/graduate course (also known as a double numbered 400/800 course).

For students who received a Master's from this department and in the same area of study, the minimum course requirements shall be decided in consultation with the PhD Advisory Committee and approved by the Department Head or Graduate Coordinator.

The supervisor(s) and the Department must approve all programs of study.

All Ph.D. candidates will take a comprehensive examination administered in two parts by the candidate's thesis committee. Part I deals with the candidate's background in his/her chosen area of research. Part II consists of the candidate's thesis proposal. The Ph.D. Part I report must be submitted to the Department within 10 months of the start of the program, and the Ph.D. Part I Comprehensive Examination should be held no later than two months from the report submission date. An external/internal examiner (outside ECE Department, within Queen's University) is added to the Internal Thesis Committee to form the Ph.D. Supervisory Committee for Part II. The Ph.D. Part II report must be submitted to the Department within 22 months of the start of the program, and the Ph.D. Part II Comprehensive Examination should be held no later than two months from the report submission date. After the successful completion of Part II, thesis research progress is reported by the candidate and reviewed by the Ph.D. Supervisory Committee annually.