

# ELECTRICAL AND COMPUTER ENGINEERING, PH.D.

Electrical & Computer Engineering

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(<https://umanitoba.ca/engineering/electrical-and-computer-engineering/>)

**Academic Staff:** Please refer to the Electrical and Computer Engineering (<https://umanitoba.ca/engineering/faculty-staff/electrical-and-computer-engineering/>) website for Faculty information.

## Electrical & Computer Engineering (ECE) Program Information

The department offers programs leading to the Master of Engineering, Master of Science, and Doctor of Philosophy. Students may select either a specialized research-oriented activity, an interdisciplinary program, or collaboration with industry or research centres in Canada.

## Admission Information

### Admission to the Faculty of Graduate and Postdoctoral Studies

Application and Admission Procedures are found in the Academic Guide (<https://catalog.umanitoba.ca/graduate-studies/academic-guide/application-admission-registration-policies/>).

Admission requirements for doctoral students are found in the Doctor of Philosophy General Regulations (<https://catalog.umanitoba.ca/graduate-studies/academic-guide/doctor-philosophy-general-regulations/>) section of the Guide.

### ECE Ph.D. Admission Requirements

The student must normally hold a Master of Science degree in Electrical or Computer Engineering and have received tentative approval from a professor in the Department of Electrical & Computer Engineering. A 3.5 GPA or higher is recommended

## Application Information

Students should complete and submit their online application with supporting documentation by the date indicated on the ECE Ph.D. program of study (<https://umanitoba.ca/explore/programs-of-study/electrical-and-computer-engineering-phd/>) page.

## Degree Requirements

The Ph.D. program in Electrical and Computer Engineering depends on student classification as follows:

- **M.Sc.** degree in Electrical or Computer engineering and who have been admitted directly into the Ph.D. program
  - minimum of 12 credit hours of Advisory Committee-approved coursework is required

- courses must be at the 7000 level or higher
- at least 6 of the 12 credit hours must be from the ECE department
- **B.Sc.** degree in Electrical or Computer Engineering and who are
  - recommended for transfer into the Ph.D. program from the ECE M.Sc. program at this university
  - minimum of 24 credit hours of Advisory Committee-approved coursework is required
    - 9 credit hours **MUST** be at or above the 7000 level
    - 6 credit hours may be
      - Other department: at or above the 3000 level **or**
      - ECE department: 4000 level elective courses
    - at least 12 of the 24 credit hours **must** be from the ECE department
    - In the case of a transfer from an M.Sc. program to the ECE Ph.D. program credit may be given for approved coursework completed at the M.Sc. level
- **Transferred from the M.Sc program**
  - Please see info at [http://umanitoba.ca/faculties/engineering/departments/ece/curr\\_students/graduate/transfer-to-phd.html](http://umanitoba.ca/faculties/engineering/departments/ece/curr_students/graduate/transfer-to-phd.html)
- **For all other categories of students**
  - a minimum of 24 credit hours of advisory committee-approved coursework is required if the student does not hold a M.Sc., otherwise 12 credit hours is required
    - of which 9 credit hours must be at or above the 7000 level
    - the balance of 6 credit hours must be at or above the 3000 level from other departments or 4000 level elective courses from the ECE department
    - at least 12 of the 24 credit hours must be from the Dept. of Electrical and Computer Engineering department
  - A Ph.D. thesis, which is based on research work normally carried out at this university, is required.

**Expected Time to Graduate:** 3.5 years

## Progression Chart

### Ph.D. Students Holding a Master's Degree

| Course                             | Title  | Hours     |
|------------------------------------|--|-----------|
| <b>Years 1-2</b>                   |  |           |
| GRAD 7300                          | Research Integrity Tutorial                              | 0         |
| GRAD 7500                          | Academic Integrity Tutorial                              | 0         |
| GRAD 8010                          | Doctoral Candidacy Examination                           | 0         |
| ECE 7XXX                           | ECE Courses designated 7000 level or higher <sup>1</sup> | 12        |
| <b>Hours</b>                       |  | <b>12</b> |
| <b>Year 2</b>                      |  |           |
| Ph.D. Thesis Proposal Presentation |  | 0         |
| <b>Hours</b>                       |  | <b>0</b>  |
| <b>Years 3-6</b>                   |  |           |
| GRAD 8000                          | Doctoral Thesis  | 0         |
| <b>Hours</b>                       |  | <b>0</b>  |
| <b>Total Hours</b>                 |  | <b>12</b> |

<sup>1</sup> TBD (Course must be in the student's field of research) – Must be approved by Academic Advisor. With permission from the Academic Advisor and Department students may take courses outside of ECE.

### Ph.D. Students Without a Master's Degree

| Course                             | Title  | Hours        |
|------------------------------------|--|--------------|
| <b>Years 1-2</b>                   |  |              |
| GRAD 7300                          | Research Integrity Tutorial  | 0            |
| GRAD 7500                          | Academic Integrity Tutorial  | 0            |
| GRAD 8010                          | Doctoral Candidacy Examination   | 0            |
| <b>Hours</b>                       |  | <b>0</b>     |
| <b>Years 1-2.5</b>                 |  |              |
| ECE 7XXX                           | ECE Courses designated 7000 level or higher <sup>1,2</sup>                             | 12-24        |
| ECE 4XXX                           | ECE Courses designated 4000 level or higher outside ECE, 3000 or higher <sup>1,3</sup> | 6            |
| <b>Hours</b>                       |  | <b>18-30</b> |
| <b>Year 2</b>                      |  |              |
| Ph.D. Thesis Proposal Presentation |  | 0            |
| <b>Hours</b>                       |  | <b>0</b>     |
| <b>Years 3-6</b>                   |  |              |
| GRAD 8000                          | Doctoral Thesis  | 0            |
| <b>Hours</b>                       |  | <b>0</b>     |
| <b>Total Hours</b>                 |  | <b>18-30</b> |

<sup>1</sup> TBD (Course must be in the student's field of research) – Must be approved by Academic Advisor.

<sup>2</sup> At least 12 of the 24 credit hours **must** be from the ECE Department.

<sup>3</sup> **Up to** 6-credit hours may be taken from another department.

## Registration Information

Students should familiarize themselves with the Faculty of Graduate and Postdoctoral Studies 'GRAD' courses applicable to their program (<https://catalog.umanitoba.ca/graduate-studies/registration-information/>). If you have questions about which GRAD course(s) to register in, please consult your home department/unit.

Courses are subject to cancellation if there is insufficient enrolment. Courses with insufficient enrolment may be cancelled the first week of classes. Not all courses will be offered each year – contact the department for courses that will not be offered. All returning and newly admitted students must see an academic advisor or the department head prior to attempting to register.

## Regulations

Students must meet the requirements as outlined in both Supplementary Regulation and BFAR documents as approved by Senate.

### Supplementary Regulations

Individual units may require specific requirements above and beyond those of the Faculty of Graduate and Postdoctoral Studies, and students should consult unit supplementary regulations (<https://umanitoba.ca/graduate-studies/supplementary-regulations/>) for these specific regulations.

### Bona Fide Academic Requirements (BFAR)

Bona Fide Academic Requirements (BFAR) (<https://catalog.umanitoba.ca/graduate-studies/academic-guide/academic-performance-general/#BFAR>) represent the core academic requirements

a graduate student must acquire in order to gain, and demonstrate acquisition of, essential knowledge and skills.

All students must successfully complete:

- GRAD 7300 prior to applying to any ethics boards which are appropriate to the student's research or within the student's first year, whichever comes first; and
- GRAD 7500 within the first term of registration;

unless these courses have been completed previously, as per Mandatory Academic Integrity Course (<https://catalog.umanitoba.ca/graduate-studies/academic-guide/academic-performance-general/#GRAD7500>) and Mandatory Research Integrity Online Course (<https://catalog.umanitoba.ca/graduate-studies/academic-guide/academic-performance-general/#GRAD7300>).

Students must also meet additional BFAR requirements (<https://umanitoba.ca/graduate-studies/student-experience/core-academic-requirements/#additional-requirements-by-program>) that may be specified for their program.

### General Regulations

All students must:

- maintain a minimum degree grade point average of 3.0 with no grade below C+,
- meet the minimum and not exceed the maximum course requirements, and
- meet the minimum and not exceed the maximum time requirements (in terms of time in program and lapse or expiration of credit of courses).