

Electrical and Computer Engineering, MS

The Department of Electrical and Computer Engineering stimulates excellence in scholarship and research through close contact with the faculty and programs tailored to fit students' individual needs.

Students select an advisor and, with the advisor, plan an individual program bounded only by the broad guidelines of the Graduate College and the program. The department maintains close interdisciplinary ties with other University of Iowa departments, especially with the departments of Physics and Astronomy and Computer Science (College of Liberal Arts and Sciences); the Roy J. Carver Department of Biomedical Engineering and the departments of Industrial and Systems Engineering and Mechanical Engineering (College of Engineering); and the Carver College of Medicine. Principal areas of graduate study include medical image analysis, signal and image processing, control systems and systems theory, wireless communications, waves and materials, computer systems, and computational genomics. View principal areas of study under Research and Study Areas in the Electrical and Computer Engineering section of the catalog.

Learning Outcomes

Students will:

- demonstrate a broad knowledge of electrical and computer engineering topics;
- be able to analyze electrical and computer engineering problems and apply their knowledge to solve them; and
- demonstrate professional skills of effective communication and ethical conduct in professional, social, and scholarly activities.

In addition to the learning outcomes listed, students who complete a thesis will:

- demonstrate a mastery of concepts in their specific area of study;
- be able to employ experimental methods to investigate and generate reports for research-oriented problems; and
- demonstrate leadership in professional, social, and scholarly activities.

Requirements

The Master of Science program in electrical and computer engineering requires 30 s.h. of graduate credit with or without thesis. Either option may precede PhD study. MS students must maintain a UI cumulative grade-point average of at least 3.00.

Thesis students must complete at least 12 s.h. from an approved list of electrical and computer engineering courses and 6 s.h. in ECE:5999 Research: Electrical and Computer Engineering MS Thesis. Nonthesis students must complete at least 18 s.h. from an approved list of electrical and computer engineering courses; they may count no more than 3 s.h. of independent study toward the degree. For a list of approved courses, see the Department of Electrical and Computer Engineering Graduate Handbook on the department's website.

Courses required for the BSE in electrical engineering do not count toward the MS requirements.

Students who plan to satisfy thesis requirements must successfully complete a final examination, which is conducted by a committee of at least three faculty members. The final examination consists of an oral defense of the thesis.

Software Engineering Subprogram

A software engineering subprogram is available to both thesis and nonthesis students. Both thesis and nonthesis options require a minimum of 30 s.h. of graduate credit. All rules for additional credit and the MS final examination are the same as for the MS without the subprogram. Successful completion of the subprogram results in a degree designation that specifies the software engineering subprogram on a student's transcript.

The MS in electrical and computer engineering with a software engineering subprogram requires the following coursework.

Course #	Title	Hours
ECE:5320	High Performance Computer Architecture	3
ECE:5330	Graph Algorithms and Combinatorial Optimization	3
ECE:5800	Fundamentals of Software Engineering	3
ECE:5810	Formal Methods in Software Engineering	3
ECE:5820	Software Engineering Languages and Tools	3
ECE:5830	Software Engineering Project	3

In addition to the listed courses, thesis students complete another 3 s.h. of approved coursework and 6 s.h. in ECE:5999 Research: Electrical and Computer Engineering MS Thesis; nonthesis students complete another 9 s.h. of approved coursework. Students who complete one or more required courses as undergraduates can substitute courses from the list of approved electrical and computer engineering courses; see the list of approved courses in the Department of Electrical and Computer Engineering Graduate Handbook on the department's Graduate Program Information website.

Admission

Applicants must meet the admission requirements of the Graduate College; see the Manual of Rules and Regulations on the Graduate College website.

Applicants must have a grade-point average (GPA) of at least 3.00 on all electrical and computer engineering, mathematics, and physics coursework. Those with a GPA between 2.75 and 3.00 in electrical and computer engineering, mathematics, and physics coursework may be admitted on probation if warranted by other aspects of their academic records.

Students with baccalaureate degrees in related areas (e.g., physics, mathematics, and computer science) may be admitted on conditional status. They may be required to complete additional coursework, without earning graduate credit, before being granted regular status.

Each application is reviewed individually. Extenuating circumstances may permit deviations from the usual standards.

Career Advancement

The engineering profession is a foundation for a variety of careers in industry, medicine, law, government, and consulting. Electrical engineers find employment everywhere smart technology is employed. On average, 93-98% of graduates are employed in their field of study or pursuing advanced education within seven months of graduation.

Engineering Career Services develops and promotes experiential education and professional opportunities for students. Professional staff coordinate the college's co-op and internship program, engage in employer outreach, and provide opportunities for students to network with employers, including an engineering career fair and other career-development programming each semester.

Engineering Career Services also offers individual advising and class presentations on résumé and cover letter preparation, job and internship search strategies, interviewing skills, and job offer evaluation.

Academic Plans

Sample Plan of Study

Sample plans represent one way to complete a program of study. Actual course selection and sequence will vary and should be discussed with an academic advisor. For additional sample plans, see MyUI.

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Course	Title	Hours
Academic Career		
Any Semester		
30 s.h. must be graduate level coursework; graduate transfer credits allowed upon approval. More information is included in the General Catalog and on department website. ^{a, b}		
Hours		0
First Year		
Fall		
ENGR:7270	Engineering Ethics ^c	1
ECE required course ^d		3
ECE required course ^d		3
ECE required course ^d		3
ECE:5000	Graduate Seminar: Electrical and Computer Engineering ^e	0
Hours		10
Spring		
ECE required course ^d		3
ECE required course ^d		3
ECE required course ^d		3
ECE:5000	Graduate Seminar: Electrical and Computer Engineering ^e	0
Hours		9
Second Year		
Fall		
Elective course ^f		3
Elective course ^f		3
Elective course ^f		2

ECE:5000	Graduate Seminar: Electrical and Computer Engineering ^e	0
Hours		8
Spring		
Elective course ^f		3
ECE:5000	Graduate Seminar: Electrical and Computer Engineering ^e	0
Final Exam ^g		3
Hours		3
Total Hours		30

a Students must complete at least 18 s.h. from an approved list of Electrical and Computer Engineering courses; they may count no more than 3 s.h. of independent study toward the degree.

b Students must complete specific requirements in the University of Iowa Graduate College after program admission. Refer to the Graduate College website and the Manual of Rules and Regulations for more information.

c Must be completed during first semester.

d Work with faculty advisor to determine appropriate coursework and sequence, depending on area of interest or specialization; may include no more than 3 s.h. of independent study.

e Required attendance every semester until degree completion.

f Work with academic advisor to determine appropriate elective coursework and sequence.

g Completion of degree requirements.