MS in Electrical and Computer Engineering

The Master of Science in electrical and computer engineering is designed to provide in-depth specialization in a particular area in electrical or computer engineering. Areas of specialization offered by the program are communication and signal processing, computing systems, control systems and robotics, and power and energy systems. Students choose their area of specialization in consultation with their advisor.

Admission

The program admits students with a bachelor's degree in electrical engineering, computer engineering or a related area. Students from other engineering fields, mathematics or science can be admitted as well with an extra requirement to complete undergraduate level background deficiency courses determined at the time of admission. Such courses will not count towards the MS degree completion requirements.

To be considered for admission to the program the minimum requirements are:

- Student must have earned a GPA of at least 3.000 (or an equivalent score from another country) in the bachelor's degree.
- Students whose bachelor's degree is from an institution outside the U.S. are required to submit official scores of the GRE General Test along with the admission application. However, there is no minimum score requirement.
- Applicants whose native language is not English must provide English proficiency exam scores. One of the following is required: TOEFL score at or above 79 in internet-based exam or IELTS score at or above 6.5.

The following are optional but encouraged, especially if the student's GPA and/or GRE do not truly reflect the student's skills and/or abilities:

- Statement of purpose, and/or
- Two letters of recommendation.

Program Requirements

Each MS in electrical and computer engineering student chooses a major specialization area. Major areas in the department are communication and signal processing, computer engineering, control systems and robotics, and power and energy systems.

Students must choose one of the three graduating options: thesis, project or coursework#only. A total of 30 credit hours of graduate work is required for all options. All courses must be approved by the student's advisor and the graduate coordinator. Students are advised to consult their advisor (if thesis or project option) or graduate coordinator (if coursework only option) before taking any courses, especially if they are below 600 level or offered outside the home department (i.e., for courses that are not ECE or CS prefixed).

Students are strongly advised to choose their area of specialization in consultation with their advisor and/or graduate coordinator before completing their first semester. To ensure that students take relevant courses, students should seek approval from their advisor or graduate coordinator at each semester unless they have filed a plan of study. Courses that are taken without prior approval may affect the plan of study process, if deemed not to satisfy the graduation requirements.

Graduating Options
Thesis Option

Students need to complete an in-depth research project. Students should conduct extensive literature review, identify gaps, propose a research question, and seek a solution to the research question. This is ideal for students who desire to develop their research skills or plan to pursue a research career. Students will defend their findings to their thesis committee. One out of the three committee members must be outside the home department. Students are encouraged to take 6 credit hours of individual reading courses with their advisors leading to taking thesis credits.

Course	Title	Hours
ECE 792	Linear Systems	3
ECE 876	MS Thesis	6
Select one of the following courses:		3
ECE 754	Probabilistic Methods in Systems	
ECE 711	Optimization Techniques for Cyber-Physical Systems	
Select 18 credit hours of graduate courses		18
Selection has to be made in consultation and with the consent of the thesis advisor		
At most 6 credit hours of CS 893 Individual Reading or Project		
Total Credit Hours		**30**

Project Option

Students solve a specific problem or an issue of significance. Typically, students will find and implement a solution to the problem identified. The problem and its solution might be less original compared to the thesis option. Students will identify a problem, define a solution approach, implement it, collect necessary data and analyze. Students will submit a written project report to a committee of three faculty members (with graduate status) and present their findings. Students are encouraged to take 3 credit hours of individual reading courses with their advisors leading to taking project credits.

Course	Title	Hours
ECE 792	Linear Systems	3
CS 891	Project	3
Select one of the following courses:		3
ECE 754	Probabilistic Methods in Systems	
ECE 711	Optimization Techniques for Cyber-Physical Systems	
Select 21 credit hours of graduate courses		21
Selection has to be made in consultation and with the consent of the project advisor		
At most 3 credit hours of CS 893 Individual Reading or Project		
At most 6 credit hours below the 700 level		
Total Credit Hours		**30**

Coursework Option

Course	Title	Hours
ECE 792	Linear Systems	3
Select one of the following courses:		3
ECE 754	Probabilistic Methods in Systems	
ECE 711	Optimization Techniques for Cyber-Physical Systems	
One of the following applied learning component courses [1]		3
ECE 875	Computer Systems in Data Analytics	
ECE 826	Digital Communication Systems II	

ECE 893	Optimal Control	
ECE 897	Operation and Control of Power Systems	
Select 21 credit hours of graduate courses		21
Selection must be approved by the graduate coordinator of the program		
No credit hours of CS 893 Individual Reading or Project will apply		
At most 6 credit hours below the 700 level		
At least 6 credit hours must be at the 800 level or higher [1]		
Total Credit Hours		**30**

[1] At least 9 credit hours of 800 or higher level courses must be taken, 3 of which comes from the applied learning component.

Applied Learning

Students in the MS in electrical and computer engineering program are required to complete an applied learning or research experience to graduate from the program. The requirement can be met for the thesis and project options by completing the thesis or project. For the coursework option, applied learning is satisfied by one of the applied learning courses as identified among the requirements in the table (ECE 875, ECE 826, ECE 893 or ECE 897).