

Electrical and Computer Engineering

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Mission

The Master of Science in Electrical Engineering and the Master of Science in Computer Engineering degree programs are designed to provide a higher degree of mastery of electrical and computer engineering fundamentals, emphasizing practical applications, thereby expanding the students' technological horizons and preparing professionals for advanced level positions and for admission to doctoral programs.

Objectives

The objective of these programs is to prepare graduates for successful and dynamic professional careers through a course of study that provides:

1. a strong grasp of electrical engineering and computer engineering fundamentals through a diverse and flexible curriculum
2. skills in practical applications, contemporary industrial needs and emerging technologies
3. a foundation for increasing professional responsibilities or continued study at the doctoral level

Admission Requirements

Electrical Engineering Degree

Applicants must possess one of the following:

1. A baccalaureate degree in electrical engineering from a program accredited by the Engineering Accreditation Commission of ABET, Inc., or from a recognized foreign institution.
2. A baccalaureate degree in another area of engineering, physics, or mathematics.

Applicants who have a baccalaureate degree in another area of engineering, physics, or mathematics may be admitted into the program provided they complete undergraduate prerequisites specified by the Graduate Program Director. These courses must be completed with a minimum grade point average of 3.00 with no grade lower than C. These courses will not satisfy any requirements for the Master of Science in Electrical Engineering degree. Generally, students must complete prerequisite courses before they are permitted to register for graduate courses. Exceptions require the recommendation of the Graduate Program Director and the approval of the Dean of Engineering.

Computer Engineering Degree

Applicants must possess one of the following:

1. A baccalaureate degree in computer (or electrical) engineering from a program accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology or from a recognized foreign institution.
2. A baccalaureate degree in another area of engineering, physics or mathematics.

Applicants who have a baccalaureate degree in another area of engineering, mathematics, or physics may be admitted if they have a background which includes nine credits of calculus and three credits of probability. They must also complete undergraduate courses in Computer Programming, Introduction to Digital Systems, and Microcomputers with a minimum grade point average of 3.0 with no grade lower than C (these courses will not satisfy any requirements for the Master of Science in Electrical Engineering degree). Generally, students must complete prerequisite courses before they are permitted to register for graduate courses. Exceptions require the recommendation of the Graduate Program Director and the approval of the Dean of Engineering.

Degree Requirements

A student must complete a minimum of thirty credit hours of graduate course work. Specific requirements follow:

Electrical Engineering Degree

One of the following:	3
ECEG 702 Signals, Systems and Transforms II	
ECEG 701 Signals, Systems and Transforms I	
ECEG 710 Probability and Stochastic Processes	
Three electrical engineering courses	9
Four courses chosen from Electrical and Computer Engineering Department	12
Two courses from any offerings by the Electrical and Computer Engineering Department, or any Graduate Core course	6
Six course credits can be substituted by Masters Thesis option under the direction of a Thesis Advisor.	
Total Credits	30

Electives may also be selected from the Graduate Core courses with the advice and approval of the Graduate Program Director.

Any modifications to program requirements must be approved by the Graduate Program Director.

Computer Engineering Degree

One of the following:	3
ECEG 520 Computer Architecture I	
ECEG 727 Computer Networks	

ECEG 721 Embedded Systems	
Three computer engineering courses	9
Four courses chosen from Electrical and Computer Engineering Department	12
Two courses from any offerings by the Electrical and Computer Engineering Department, or any Graduate Core course	6
Six course credits can be substituted by Masters Thesis option under direction of a Thesis Advisor	
Total Credits	30

Any modifications to program requirements must be approved by the Graduate Program Director.

Master of Science Degree Description and Options for Electrical Engineering and Computer Engineering

Master of Science students may elect to complete a Master of Science by coursework or by thesis. The coursework option entails 30 course credits; the thesis option entails 24 course credits and 6 master's thesis research credits, ECEG 799. In both cases, the minimum number of total credits is 30. At this level, research undertaken under the thesis option should exhibit a thorough understanding of advanced scientific thought and an ability to apply advanced engineering design principles, and planning.

Manuscript Presentation

Degree candidates must present their research to the appointed guidance committee in final manuscript form for official acceptance no later than two weeks before the end of the semester.

Graduate students registered for thesis credits must submit four final bound copies to the Electrical and Computer Engineering Department for necessary signatures one week before the end of the semester.

Concentration Programs

Graduate concentration programs, which consist of prescribed courses in a specific concentration area, are available through the Electrical and Computer Engineering graduate program as follows:

- Applied Bioinformatics
- Bioelectric Engineering
- Robotic Vision, Imaging, and Computer Graphics
- Unmanned Autonomous Guided Systems
- Cybersecurity Systems
- Embedded Computing
- High Performance Computing
- Power Systems

Big Data, Data Mining, and Analytics

Unless otherwise noted, courses in these programs may be applied to a Master's of Science Degree in the Electrical and Computer Engineering. While approval of the Graduate Program Director is required to enroll in a graduate course, admission to the Graduate Program is not required to participate in a Concentration Program. It is expected, however, that individuals desiring to take graduate-level courses in a Concentration Program will have a baccalaureate degree in either an engineering field, a science or applied science field, or mathematics, and will meet the pre-requisite requirements of the courses they wish to take in a Concentration Program. Specific information regarding Graduate Electrical and Computer Engineering Concentration is available on the Electrical and Computer Engineering website (<https://manhattan.edu/academics/schools-and-departments/school-of-engineering/.electrical-computer-dept/graduate/>).