MASTER OF SCIENCE IN ELECTRICAL ENGINEERING

Department: Electrical and Computer Engineering (https://catalog.bradley.edu/graduate/engineering-technology/electrical-computer-engineering/)

Admission

MSEE Program Admission

- Applicants must submit material described in the general admission requirements of Graduate Education.
- Successful completion of an undergraduate electrical or computer engineering or similar program is required for admission.
- Applicants must have achieved a 3.0 GPA on a 4.0 scale in the last 60 semester hours of undergraduate coursework.
- Conditional admission may be given if the student's last 60-hour GPA is below a 3.0 and above a 2.5 on a 4.0 scale. It may also be given if the student's scores on standardized tests fall below the requirement in the discipline; if the student does not have sufficient undergraduate preparation; or in the judgment of the faculty, the quality of work is not totally acceptable. If undergraduate deficiencies are a cause of conditional admission, the faculty in the discipline shall specify the additional coursework prerequisites and/or a standard of achievement in prescribed coursework which will remove the deficiencies.
- Plans of study are also available for those with non-electrical engineering or non-engineering undergraduate degrees. Further information can be obtained by contacting the ECE graduate program coordinator.

Program of Study

Students work closely with the ECE graduate program coordinator to write a program of study best suited to their background and interests. Course sequences, design projects, and research are available in a broad range of areas such as cyber-physical systems, computer engineering, controls and robotics, Industrial Automation and Cybersecurity, Internet of Things (IoT) and networking, Machine learning and AI, RF and wireless communication, and signal processing.

Examples of areas of focus with their associated courses are listed below:

Wireless Communication, RF and Signal Processing

Code	Title	Hours
ECE 531	Communication Theory I	3.0
ECE 550	Electromagnetic Theory	3.0
ECE 551	Radio Frequency Circuits and Systems	3.0
ECE 552	Wireless Communication Systems	3.0
ECE 553	Radio Frequency Communications Laboratory	3.0
ECE 560	Digital Signal Processing	3.0

Controls, Robotics and Mechatronics

Code	Title	Hours
ECE 541	Feedback Control of Dynamic Systems	3.0
ECE 542	Advanced Data-Driven Control and Applications	3.0
ECE 543	Distributed Learning Control of Dynamic Systems	3.0
ECE 544	Autonomous Robotics	3.0
ECE 568	Mechatronics	3.0
ECE 574	Mobile Robot Navigation and Mapping	3.0

Power Electronics and Alternative Energy

Code	Title	Hours
ECE 541	Feedback Control of Dynamic Systems	3.0
ECE 542	Advanced Data-Driven Control and Applications	3.0
ECE 543	Distributed Learning Control of Dynamic Systems	3.0
ECE 545	Power Electronics Fundamentals	3.0
ECE 546	Power Laboratory	3.0

Machine Learning, Computer Vision, and Digital System Design

Code	Title	Hours
ECE 562	Digital Image Processing	3.0
ECE 563	Medical Imaging	3.0
ECE 565	Engineering Applications of Machine Learning	3.0
ECE 581	Digital Systems: Design and Synthesis	3.0
ECE 582	Digital Systems: High Level Synthesis and Codesign	3.0
ECE 583	Digital Systems: Microprocessor Architecture and Design	3.0

Internet of Thing (IoT), Networking, and Cybersecurity

Code	Title	Hours
ECE 570	Embedded Data Structures and Object Oriented Programming	3.0
ECE 571	Real-time Operating Systems	3.0
ECE 572	Embedded Microcontroller Linux	3.0
ECE 573	Embedded TCP/IP	3.0
ECE 575	Security for Industrial Automation	3.0
ECE 581	Digital Systems: Design and Synthesis	3.0
ECE 582	Digital Systems: High Level Synthesis and Codesign	3.0

In addition, Students may work on special topics in Electrical and Computer Engineering to address emerging applications, conduct a research project or work on their thesis with faculty advisor. The ECE department has excellent computer and laboratory facilities to support advanced studies in these areas.

Advanced Topics and Research

Code	Title	Hours
ECE 681	Topics in Electrical Engineering	0.0-6.0
ECE 691	Research I	0.0-6.0
ECE 699	Thesis	0.0-6.0

Degree Requirements

Students admitted to the graduate program in Electrical Engineering pursuing an MS degree in Electrical Engineering must meet the general graduation requirements of Bradley graduate programs, and need to complete 30 semester hours of graduate course work. Students work with the MSEE graduate program coordinator to identify focus area best suited to their background and interests.

Thesis Option

Recommended for investigating a problem in depth for a semester or more

- 18 hours of approved ECE graduate courses
  - at least 9-hours from the student's focus area
- 6 hours of approved elective courses
- 6 hours of thesis in the student's research area
- Comprehensive assessment: Thesis presentation, demonstration, and thesis

Project Option

Recommended for investigating a problem in depth for a semester

- 21 hours of approved ECE graduate courses
  - at least 12-hours from the student's focus area
- 6 hours of approved elective courses
- 3 hours research project or design project in student's focus area
- Comprehensive assessment: Project presentation, demonstration, and report

Students are required to have at least 3 hr of research experience either from research project or thesis; Students may appeal the research requirement to the graduate coordinator by documenting prior experience. If approved, students will instead take a 3 hr of approved ECE graduate course to meet the MSEE degree requirements.

All the courses to be counted towards the MSEE degree must be listed in the student’s Graduate Program of Study. This document must be approved by the ECE graduate program coordinator before completion of their first semester in the MSEE. In addition, students may take up to 6 hours of approved elective graduate level courses from other departments. Request to Change Program of Study form is needed to change the Graduate Program of Study. This request must be filed prior to registering for courses and approved by the ECE graduate program coordinator.