# Master of Science in Electrical Engineering

## About This Program

The Master of Science in Electrical Engineering (MSEE) provides practicing engineers with advanced, up-to-date education in electrical engineering. It provides for students who wish to increase knowledge in many areas of electrical engineering. Graduate study and research are offered in five fields.

### COMMUNICATION AND SIGNAL PROCESSING

Communication and signal processing connect our digital world. This field uses fundamental theory in signal and information processing, designs spectrum and energy efficient communications system or sensor networks for data gathering and transmission, and keeps pushing the boundaries of scientific discovery. Recent examples include 5G mobile wireless communications, Internet of Things, Machine Learning, Big Data, Virtual Reality, etc.

### COMPUTER AND DIGITAL CIRCUITS

Computer and digital circuit engineering integrates digital electronics with computer sciences, involving hardware and software in a wide range of industry sectors and consumers' daily lives. Many of our household and commercial items make use of digital electronics, including computers, smartphones, vehicles, airplanes, televisions, remote controls, and other entertainment systems. Computer hardware engineers, including digital circuit designers, work on developing microprocessors, memory chips, data storage, and computer networking devices while computer software engineers develop operating systems, computer programs, computer networks, and software securities. Local employers include Texas Instruments, TSMC, Facebook, Lockheed Martin, Intel, Mathworks, and Boeing.

### CONTROL SYSTEMS

Control systems engineering studies the design and implementation of feedback control systems which are responsible for the safe and efficient automatic operation of all human engineered systems. Examples include aircraft autopilots, automobile speed control, automated drug delivery, and industrial process control. The theoretical basis for modern control systems was developed during the Industrial Revolution in the 18th century for the steam engine, steam locomotive, and automated windmills.

### PHOTONICS AND ELECTRONICS

Photonics is the science of using light to generate energy, detect information, or transmit information. The main purpose of the photonics engineering field is to develop new and innovative products for medicine, telecommunications, manufacturing, and construction. From light that can connect all electronic devices, to ultra-performance lasers used in data centers and autonomous cars, photonics engineers are responsible for significant scientific discoveries and smart societies.

### POWER AND ENERGY

Power systems engineers design, develop, and operate electrical power systems. The field is broad and becoming broader with deregulation, smart grid development, decarbonization, and inverter-based resources. Future power systems engineers will have to implement more intelligent control, low environmental impact resources, battery storage systems, and power electronic converters for global power system transformation.

## Competencies

1. Upon graduation, students will demonstrate comprehensive knowledge of advanced electrical engineering principles and techniques, applying them to design and analyze systems in their area of specialization.
2. Upon graduation, students will be able to formulate, analyze, and solve engineering problems using modern tools, methods, and technologies in electrical engineering.
3. Upon graduation, students will be able to design and execute research or project-based studies that address practical or theoretical challenges in electrical engineering.
4. Upon graduation, students will work effectively in teams, contributing their expertise to achieve shared objectives in multidisciplinary environments.
5. Upon graduation, students will communicate technical concepts, research findings, and engineering solutions effectively through written reports, presentations, and discussions tailored to diverse audiences.

## Admissions Criteria

### UNCONDITIONAL ADMISSION

GRE is not required for admission. In addition to the minimum requirements for graduate admission (https://catalog.uta.edu/academicregulations/admissions/graduate/), the typical MS applicant who is admitted will have met the following requirements:

- Document a minimum undergraduate GPA of 3.25 (on a 4.0 scale) in upper division coursework (junior and senior level or equivalent).
- Hold an rigorous undergraduate degree relevant to the EE curriculum from a reputable institution.

- Satisfactory answers to the EE Department supplementary questions.
- International student must meet the minimum university English language requirements.

### PROVISIONAL ADMISSION

An applicant unable to supply all required official documentation prior to the admission deadline, but whose available documentation otherwise appears to meet admission requirements may be granted provisional admission.

### PROBATIONARY STATUS

An applicant whose undergraduate courses do not cover the breadth required for a MS student may be placed on probationary status until equivalent coursework is completed.

### DEFERRED STATUS

A deferred decision may be granted when a file is incomplete.

### DENIED STATUS

An applicant that does not meet any of the above qualifications will be denied admission.

### PART-TIME STATUS

US industrial or government employees who will work full time in electrical engineering or related areas may be granted part-time status. Part-time students maintain residency if enrolled in at least 3 hours each long semester.

### FELLOWSHIPS

Award of a fellowship will be based on the criteria required by the sponsor agency (including the graduate school) on a competitive basis.

## Curriculum

| | | |
|---|---|---|
| **All Tracks** | | |
| Select 18 hours from the following: | | 18 |
| 5000/6000 level EE courses. | | |
| Courses in math, science, or other engineering disciplines approved by adviser (up to 9 hours). | | |
| **Thesis Option** | | |
| Complete 12 hours in the following: | | 12 |
| EE 5398 | THESIS | |
| EE 5698 | THESIS | |
| **Non-Thesis Option** | | |
| Select 12 hours from 5000/6000 level EE courses (Part-time students may substitute up to 12 hours in EE 5391 for required electives). | | 12 |
| **Total Hours** | | **30** |

## Program Completion

To continue in the MSEE students must maintain at least a 3.0 GPA in all coursework.

The thesis option student's thesis supervisory committee shall consist of at least two members of the Graduate Faculty, and the Committee Chair must be in Electrical Engineering.

## Advising Resources

**EE Advising - General information**

### ELECTRICAL ENGINEERING

### Location:

Master's - NH 531

Ph.D. - NH 545

### Email:

ee_grad_advising@uta.edu

## Phone:

Master's - 817-272-3423

Ph.D. - 817-272-3472

## Web:

Master's - Schedule graduate advising (https://outlook.office365.com/owa/calendar/EEGradAdv@bookings.uta.edu/bookings/s/W_X-t8ySDEaqCfz09loAMg2/)

Ph.D. - Schedule graduate advising (https://outlook.office365.com/owa/calendar/EEGradAdv@bookings.uta.edu/bookings/s/ja39PnPrvEC3KPK1JroI9A2/)