Electrical Engineering, M.S.E.E.

COLLEGE OF ENGINEERING

Learn more about the Master of Science in Electrical Engineering.

About the Program

The M.S.E.E. program offers students practice-oriented graduate-level education in Electrical and Computer Engineering. Concentrations include Computer Architectures and Microelectronics, Digital Signal Processing and Digital Data Communication, and Intelligent Systems and Control. Current active research projects in the department include embedded systems and system-on-chip design, intelligent interactive tutoring systems, intrusion detection, multisensor fusion, speaker identification, speech processing, and visualization and fault detection in multicasting networks. Other active areas of research include digital signal processing, heat dissipation problems in microchips, human-computer interaction, intelligent multimedia systems, robust and optimal control, and wireless data networks.

Time Limit for Degree Completion: 5 years

Campus Location: Main

Full-Time/Part-Time Status: Students complete the degree program through classes offered after 4:30 p.m. The degree program can be completed on a full- or part-time basis.

Interdisciplinary Study: The program encourages interdisciplinary research with other branches of engineering as well as with various departments in the sciences and applied mathematics. Recent collaborative work with the Department of Computer and Information Sciences includes visualization and fault detection in multicasting networks and image processing.

Areas of Specialization: For each of the three areas of specialization, research includes:

- Computer Architectures and Microelectronics — current practices of computer design and development; hardware realization and integrated circuit layout; MOS-integrated circuit design for high-speed digital computation and data communication; and software-level testing.
- Digital Signal Processing and Digital Data Communication — array signal processing; detection of faults in communication networks; detection of multidimensional signals in the presence of noise; filtering and modulation; intrusion detection, visualization, and security of multicast networks; multisensor data fusion; performance evaluation of local area and wireless networks, broadband networks, and protocols; speaker identification; and voice signal processing.
- Intelligent Systems and Control — intelligent tutoring systems, interactive multimedia, neuro-fuzzy control, and robust and optimal control.

For the M.S.E.E. program, students also choose between three tracks:

1. The Thesis Track is intended for students pursuing advanced research and includes 24 credits of didactic coursework, 3 credits of Project (ECE 9995), and 3 credits of Thesis (ECE 9996).
2. The Project Track introduces students to applied research and includes 27 credits of didactic coursework and 3 credits of Project (ECE 9995).
3. The Coursework Track provides students with an advanced engineering background for their future in the engineering profession through 30 credits of didactic coursework.

In the first term, the student and the Electrical and Computer Engineering (ECE) Graduate Program Director establish a graduate Plan of Study that outlines all required courses and the sequence for the student to follow. This form is used to track the student's progress as the various benchmarks in the program are completed. Once established, any revisions to the Plan of Study require approval in advance. However, if considering whether to change one's track, the student should note that:

- "Thesis" credits (ECE 9996) can only be applied toward the Thesis M.S.E.E. Track and cannot be applied to either the Project or Coursework Tracks.
- "Project" credits (ECE 9995) can be applied toward the Thesis and Project M.S.E.E. Tracks but cannot be used for the Coursework Track.

Job Prospects: Graduates with the M.S.E.E. are employed in high-tech industries and government laboratories with responsibilities for design, analysis, and applications of electrical engineering principles. Students who complete an M.S.E.E. with a thesis are prepared to enter a doctoral program.

Non-Matriculated Student Policy: Up to 9 credits of graduate Engineering coursework may be taken at Temple University on a non-matriculated basis and subsequently applied to the M.S.E.E. degree upon admission. If the applicant's undergraduate GPA was less than 3.0, a GPA of 3.25 or better is required on this non-matriculated graduate coursework to receive an admissions exception. Consequently, the ECE Graduate Program Director may encourage those with an undergraduate GPA less than 3.0 to take their first three graduate courses prior to making formal application to the M.S.E.E. program. (See the relevant Graduate School policies on special admission procedures for non-matriculated students: 02.23.11.03 and 02.24.19.)

Financing Opportunities: Three forms of financial aid are offered to graduate students:

1. Teaching Assistantship (TA): TA awards are made solely by the Department and require the awardee to work 20 hours per week in support of the Department's undergraduate programs. The TA is compensated with a 9-month stipend, a basic health-insurance plan, and 9 credits per term of tuition remission.
2. Research Assistantship (RA): Individual ECE faculty confer RA awards, using their research funds, upon students who appear well-qualified to carry out the research. Typically, this faculty member becomes the RA's Thesis advisor. The RA normally works up to 20 hours per week and is compensated with a stipend, basic health insurance, and tuition remission.
3. Fellowships: These highly competitive University-wide grants are typically awarded only to Ph.D.-program applicants.

Admission Requirements and Deadlines

Application Deadline:

Fall: March 1
Spring: November 1; August 1 international

Applications are processed on a continual basis. Late applications may be considered for admission. Ordinarily, the applicant is informed of an admissions decision within 4 to 6 weeks of receipt of all supporting application documents.

Applicants who plan to matriculate full-time are automatically considered for financial aid awards so no separate application for financial aid is required. **To ensure financial aid consideration for the intended term of study, however, applicants should submit a complete application by January 15 (Fall) and August 1 (Spring).**

Both admissions and financial aid award decisions originate in the Department of Electrical and Computer Engineering (ECE). Applicants are encouraged to contact the ECE Graduate Program Director for advice and consultation in the application process.

For Spring 2022 admission, *APPLY ONLINE to this graduate program*.

For Fall 2022 admission, apply at https://engineeringcas2022.liaisoncas.com/.

Letters of Reference:
Number Required: 3

From Whom: Letters of recommendation should be obtained from college or research faculty who are familiar with the applicant's competency. If the applicant has an established career in engineering, one of the letters should be provided by the applicant's immediate supervisor. If the applicant has been out of school long enough that relevant academic reference letters appear impractical, s/he should contact the ECE Graduate Program Director to obtain a waiver of this admission requirement.

Coursework Required for Admission Consideration: Students not adequately prepared for advanced courses may be required to take a number of prerequisites. The ECE Department identifies the needed coursework on a case-by-case basis.

Bachelor's Degree in Discipline/Related Discipline: A bachelor's degree in Electrical Engineering or Computer Engineering is the preferred prerequisite degree. However, students who have earned a bachelor's degree in a related field are encouraged to apply, with the understanding that remedial preparatory courses may be a pre-condition of admission to the M.S.E.E. program.

University regulations stipulate that the applicant must have earned a 3.0 grade-point average on a 4.0 scale in her/his undergraduate studies, but admission exceptions are made for a variety of circumstances. (See Graduate School Policy 02.23.11.03.) The ECE Graduate Program Director helps the applicant navigate the admission possibilities, including the "Non-Matriculated Student Policy" option.

Statement of Goals: Describe your relevant technical experiences and career goals in one to two pages.

Standardized Test Scores:
GRE: Required. Scores must be no more than 5 years in advance of the application date. (See Graduate School Policy 02.23.12.) Applicants who require a waiver of the GRE should consult the ECE Graduate Program Director concerning the mechanics and consequences of obtaining an exception.

Applicants who earned their baccalaureate degree from an institution where the language of instruction was other than English, with the exception of those who subsequently earned a master’s degree at a U.S. institution, must report scores for a standardized test of English that meet these minimums:

- TOEFL iBT: 79
- IELTS Academic: 6.5
- PTE Academic: 53

Resume: Current resume required.

Transfer Credit: Graduate credits taken at an accredited institution prior to matriculation may be transferred into the M.S.E.E. program. In order to transfer, the courses must be equivalent to courses offered at Temple in the student's area of study and research, and the grades must be "B" or better. The maximum number of credits a student may transfer is 6. (See Graduate School Policy 02.24.21.)

Test Waivers: Applicants with two or more years of employment in an engineering profession performing engineering design and analysis may request a waiver of the GRE. Consult with the ECE Graduate Program Director concerning the mechanics and consequences of obtaining an exception.

Program Requirements

General Program Requirements:
Number of Credits Required Beyond the Baccalaureate: 30

Required Courses:

Thesis Track

Code	Title	Credit Hours
Core Courses		
ECE 5022	Engineering Analysis and Applications	3
ECE 5033	Probability and Random Processes	3
ECE 5600	Graduate Seminar	0
Electives [1]		**18**
Research Courses		
ECE 9995	Project	3
ECE 9996	Thesis	3
Total Credit Hours		**30**

1 Coursework may include up to, but no more than, 3 credits of ENGR 9182 Independent Study I or 3 credits of ECE 9991 Directed Research. Furthermore, students who wish to take graduate coursework outside the College of Engineering in one of Temple University's other schools or colleges need to obtain the appropriate written approvals on their Plan of Study form.

Project Track

Code	Title	Credit Hours
Core Courses		
ECE 5022	Engineering Analysis and Applications	3
ECE 5033	Probability and Random Processes	3
ECE 5600	Graduate Seminar	0
Electives [1]		**21**
Research Course		
ECE 9995	Project	3
Total Credit Hours		**30**

1 Coursework may include up to, but no more than, 3 credits of ENGR 9182 Independent Study I or 3 credits of ECE 9991 Directed Research. Furthermore, students who wish to take graduate coursework outside the College of Engineering in one of Temple University's other schools or colleges need to obtain the appropriate written approvals on their Plan of Study form.

Coursework Track

Code	Title	Credit Hours
Core Courses		
ECE 5022	Engineering Analysis and Applications	3
ECE 5033	Probability and Random Processes	3
ECE 5600	Graduate Seminar	0
Electives [1]		**24**
Total Credit Hours		**30**

[1] Coursework may include up to, but no more than, 3 credits of ENGR 9182 Independent Study I or 3 credits of ECE 9991 Directed Research. Furthermore, students who wish to take graduate coursework outside the College of Engineering in one of Temple University's other schools or colleges need to obtain the appropriate written approvals on their Plan of Study form.

Culminating Events:

Thesis Track:

The culminating events in the Thesis Track are typically undertaken during the last two successive terms of study. Successful completion requires the following:

- Thesis Proposal — ECE 9995 Project (3 credits)
  Under the guidance of the advisor, the student conducts independent research on an applied engineering topic of current interest and registers for ECE 9995. This work includes the research and preliminary results that form the basis of an extended study that the student plans to carry on in ECE 9996 Thesis in the following term. The student submits a research report as her/his Thesis Proposal to a committee consisting of three or more faculty members, including the faculty advisor, and presents her/his proposal in an open College-wide seminar, which is scheduled and posted at least 10 business days in advance of the presentation date. Immediately following the presentation, the student's advisory committee questions the student about the details and strategy of the proposed research. The committee then accepts, accepts with revisions, or rejects the proposal.
  The student must pass the Thesis Proposal before registering for ECE 9996. If the student fails Thesis Proposal, s/he may either re-register for ECE 9995 (1 credit) in the next regular term and repeat the entire proposal process or consider switching to the Project or Coursework Track. *NOTE: A second failure of Thesis Proposal results in automatic dismissal from the University.* If switching to another track, the Plan of Study form requires updating and appropriate approvals.
- Thesis Defense — ECE 9996 Thesis (3 credits)
  The student should register for ECE 9996 in the term that s/he plans to defend the thesis. The thesis document should be prepared in a format compliant with University standards. (See Graduate School Policy 02.26.12.02.) Two weeks prior to the thesis defense, the student provides the committee with a copy of the completed thesis and posts an announcement of the defense, which is to take place during a regular academic term (i.e., not scheduled during study days, final exams, or the breaks between terms). If the student is to graduate in the same term as the thesis defense is held, then the defense should take place at least 30 days prior to the end of the term.
  The thesis defense is an open College seminar in which the student presents the concepts and results of her/his research. Immediately following the defense, the thesis committee convenes to closely examine the student's research and decide to accept the thesis as provided, accept the thesis with revisions, or not accept the thesis. If the thesis is accepted, a letter grade for ECE 9996 is assigned. If the thesis is accepted with revisions, then the student must submit the revised thesis within 30 days and with the approval of the Thesis Committee. If the thesis is not accepted, but the committee decides to not fail the student, an "R" grade is assigned to ECE 9996. In the following term, the student registers for one credit of ENGR 9991 Directed Research until s/he is again prepared to attempt the defense. The defense procedures described above are then carried out again in the term that the student is prepared to defend the thesis.

Project Track:

The culminating event for the Project Track is ECE 9995 Project. This entails a one-term research activity done under the supervision of a full-time faculty advisor on an applied engineering topic of interest. Near the end of the term, the student prepares a report of her/his findings and presents the study in an open departmental seminar. Both the seminar and the written report are used to determine the student's grade for ECE 9995. The grade is determined jointly by the advisor and another designated grader selected by the Graduate Program Director.

Coursework Track:

Successful completion of coursework constitutes the culminating event.

Contacts

Program Web Address:

https://www.temple.edu/academics/degree-programs/electrical-engineering-ms-en-ece-msee

Department Information:

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ATTN: ECE Programs, College of Engineering
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215-204-7800

Submission Address for Spring 2022 Application Materials:

https://apply.temple.edu/Engineering/

Submission Address for Fall 2022 Application Materials:

https://engineeringcas2022.liaisoncas.com/

Department Contacts:

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