Electrical and Computer Engineering MSECE

COLLEGE OF ENGINEERING

About the Program

The MSECE 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 MSECE 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 MSECE Track and cannot be applied to either the Project or Coursework Tracks.
- "Project" credits (ECE 9995) can be applied toward the Thesis and Project MSECE Tracks but cannot be used for the Coursework Track.

Job Prospects: Graduates with the MSECE are employed in high-tech industries and government laboratories with responsibilities for design, analysis and applications of electrical engineering principles. Students who complete an MSECE 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 MSECE 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 MSECE 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 PhD-program applicants.

Admission Requirements and Deadlines

Application Deadline:

Fall:

- March 1 (International)
- June 1 (Domestic)

Spring: November 1

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.

APPLY ONLINE to this graduate program.

Review tuition and financial assistant deadlines to ensure financial aid consideration for the intended term of study.

Applicants who plan to matriculate full-time are automatically considered for financial aid awards so no separate application for financial aid is required.

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.

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. Any applicant who has been out of school long enough that relevant academic reference letters appear impractical should provide recommendations by the applicant's previous or current immediate supervisor(s).

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 MSECE program.

University regulations stipulate that the applicant must have earned a 3.0 grade-point average on a 4.0 scale in their 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.

Official transcripts from all institutions of higher education attended, whether or not a degree was awarded, must be submitted. International applicants submit official transcripts or official NACES-accredited evaluation documentation that validates completion and conferral of a degree, diploma and/or certificate. All applicants must ensure transcripts and/or NACES-accredited documentation are sent directly from the institution(s) or NACES-accredited evaluation agency via email to gradengr@temple.edu or to the Temple University College of Engineering, 1947 N. 12th Street, Philadelphia, PA 19122-6077.

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

Standardized Test Scores:
GRE: Optional. If reported, scores that are not more than 5 years in advance of the application date are sent to test code 2945. (See Graduate School Policy 02.23.12.)

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 ensure official scores are reported directly by the testing agency for a standardized test of English and meet one of these minimums:

- TOEFL iBT
  - On or after January 21, 2026 – 4.5
  - Before January 21, 2026 – 79
- IETLS – 6.5
- PTE Academic – 53
- Duolingo – 110

Resume: Current resume required.

Transfer Credit: Graduate credits taken at an accredited institution prior to matriculation may be transferred into the MSEE 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.)

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 ECE 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 ECE 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 ECE 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.

Accelerated Programs

Undergraduate students may opt to pursue an accelerated +1 program, enabling them to complete both a bachelor's degree and master's degree in less time than the traditional route.

The accelerated pathway for the Electrical and Computer Engineering MSECE is available to students pursuing degrees in:

College of Engineering

- Electrical and Computer Engineering BSECE with Concentration in Bioelectrical Engineering
- Electrical and Computer Engineering BSECE with Concentration in Computer Engineering
- Electrical and Computer Engineering BSECE with Concentration in Electrical Engineering

College of Science and Technology

- Computer Science, BA or BS
- Physics, BA or BS

Cohort Code: XMSEE

Minimum Cumulative GPA: 3.00

Graduate Courses Approved to Count for Both Undergraduate and Graduate Degrees

Code	Title	Credit Hours
ECE 5022	Engineering Analysis and Applications (all majors)	3
ECE 5033	Probability and Random Processes (all majors)	3
ECE 5514	Digital Signal Processing Analysis (if ECE major with Bioelectrical concentration)	3
ECE 5612	Advanced Processor Systems (if ECE major with Computer Engineering concentration)	3
ECE 5516	Introduction to Communication Networks (if ECE major with Computer Engineering concentration)	3
1 or 2 5000 level ECE electives (depending on major) [1]		3-6

1. **Two** ECE 5000 level electives required for Computer Science majors, Physics majors and Electrical and Computer Engineering, Electrical Engineering concentration majors. **One** ECE 5000 level required for Electrical and Computer Engineering, Bioelectrical Engineering concentration majors.

Plan for Electrical and Computer Engineering, Bioelectrical Engineering Concentration BSECE major

Course	Title	Credit Hours
Year 3		
Spring		
1 5000 level ECE elective		3
	Credit Hours	**3**

Year 4		
Fall		
ECE 5022	Engineering Analysis and Applications	3
ECE 5514	Digital Signal Processing Analysis	3
	Credit Hours	**6**
Spring		
ECE 5033	Probability and Random Processes	3
	Credit Hours	**3**
	Total Credit Hours	**12**

Plan for Electrical and Computer Engineering, Computer Engineering Concentration BSECE major

Course	Title	Credit Hours
Year 3		
Spring		
ECE 5022	Engineering Analysis and Applications	3
	Credit Hours	**3**
Year 4		
Fall		
ECE 5612	Advanced Processor Systems	3
	Credit Hours	**3**
Spring		
ECE 5033	Probability and Random Processes	3
ECE 5516	Introduction to Communication Networks	3
	Credit Hours	**6**
	Total Credit Hours	**12**

Plan for Electrical and Computer Engineering, Electrical Engineering Concentration BSECE majors, Computer Science BA or BS majors or Physics BA or BS majors

Course	Title	Credit Hours
Year 3		
Spring		
ECE 5022	Engineering Analysis and Applications	3
	Credit Hours	**3**
Year 4		
Fall		
ECE 5033	Probability and Random Processes	3
	Credit Hours	**3**
Spring		
2 5000 level ECE electives		6
	Credit Hours	**6**
	Total Credit Hours	**12**

Admissions Criteria

Candidates for the +1 program must:

- have a cumulative GPA of at least 3.00 by the end of the 5th semester.
- submit an application before the end of the 5th semester of study.
- submit the following:
  - recommendation letters from two faculty members and at least one must be from a faculty member in the relevant department; these letters can be submitted in a sealed envelope to Melissa Valdes or e-mailed directly to her at melissa.valdes@temple.edu.

  - personal statement.
  - resume.
- complete required coursework as outlined in the application.

Junior applicants must be able to complete their undergraduate degree in two years from admission into the +1 program. Senior applicants must be able to complete their undergraduate degree in one year from admission into the +1 program.

Application: https://engineering.temple.edu/admissions/undergraduate-admissions/1-bachelors-masters-accelerated-degree

Contact Information

Melissa Valdes, Assistant Dean for Undergraduate Studies
melissa.valdes@temple.edu

Learn more about the +1 program in Electrical and Computer Engineering MSECE.

Contacts

Department Information:

Dept. of Electrical and Computer Engineering
ATTN: ECE Programs, College of Engineering
1947 N. 12th Street
Philadelphia, PA 19122-6077
gradengr@temple.edu
215-204-7800

Submission Address for Application Materials:

https://connect.temple.edu/portal/gr_applytoday

Department Contacts:

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