Erik Jonsson School of Engineering and Computer Science

Interdisciplinary Programs

The Erik Jonsson School of Engineering and Computer Science offers Bachelor of Science programs in Computer Engineering and in Telecommunications Engineering. These programs are delivered by faculty from the Department of Computer Science and Electrical Engineering.

Computer Engineering (BS)

The Computer Engineering program is interdisciplinary. It was designed by the combined faculties of the Computer Science Department and the Electrical Engineering Department. Computer Engineering requires a blend of knowledge from the areas of hardware (Electrical Engineering) and software (Computer Science). The focus of the Computer Engineering degree is to provide excellent education in modern computer systems and prepare its graduates for outstanding careers in the rapidly changing and growing profession and for further continuing education.

The Computer Engineering program is based on a solid foundation of science and mathematics coursework. Students in this program are given an opportunity to learn to extend their abilities to analyze and solve complex problems and to design new uses of technology to serve today's society. This program provides an integrated education experience directed toward the development of the ability to apply pertinent knowledge to the identification and solution of practical problems in computer engineering.

The Computer Engineering curriculum ensures that the design experience, which includes both analytical and experimental studies, is integrated throughout in a sequential development leading to advanced work. Design problems are frequently assigned in both lecture and laboratory courses. Each student is required to complete a major design project during the senior year. In addition, established cooperative education programs with area industries may further supplement a student's design experiences.

Affiliated Faculty


**Professor Emeritus:** William J. Pervin

**Associate Professors:** Jorge A. Cobb, Roozbeh Jafari, Neeraj Mittal, Issa M. S. Panahi
**Assistant Professors:** Joseph Callenes-Sloan, Myoungsoo Jung, Jun Wang

**Senior Lecturers:** Nathan B. Dodge, Greg Ozbirn

**Affiliated Faculty:** Cong Liu

**Mission of the Computer Engineering (CE) Program**

The mission of the Computer Engineering Program is to provide education in the theory and practice of modern computer engineering. We will prepare our graduates to have rewarding and successful careers in a diverse range of computer engineering fields, including materials, devices, circuits, digital systems, signal/speech processing, and communications.

**Goals for the Computer Engineering Program**

The focus of the Computer Engineering degree at UT Dallas is to provide excellent education in both computer science and electrical engineering. Our graduates shall be uniquely qualified to apply traditional engineering design and problem solving skills to modern computer systems comprising both hardware and software components.

**Program Educational Objectives for Computer Engineering**

Within a few years after graduation, graduates of the Computer Engineering program should:

- Have a successful, long-lived engineering based career path.
- Meet the needs of industry.
- Contribute to, and/or lead engineering based teams.
- Actively pursue continuing (lifelong) learning.

**High School Preparation**

Engineering education requires a strong high school preparation. Pre-engineering students should have high school preparation of at least one-half year in trigonometry and at least one year each in elementary algebra, intermediate and advanced algebra, plane geometry, chemistry, and physics, thus developing their competencies to the highest possible levels and preparing them to move immediately into demanding college courses in calculus, calculus-based physics and chemistry for science majors. Pre-Computer Engineering students should have some experience with elementary programming in a high level language such as C, C++, or Java. It is also essential that pre-engineering students have the competence to read rapidly and with comprehension, and to write clearly and correctly.

**Lower-Division Study**

All lower-division students in Computer Engineering concentrate on mathematics, science, and
introductory engineering courses, building competence in these cornerstone areas for future application in upper-division engineering courses. The following requirements apply both to students seeking to transfer to UT Dallas from other institutions as well as to those currently enrolled at UT Dallas, whether in another school or in the Erik Jonsson School of Engineering and Computer Science.

**ABET Accreditation**

The BS program in Computer Engineering is accredited by the Engineering Accreditation Commission of ABET, [www.abet.org](http://www.abet.org).

**Academic Progress in Computer Engineering**

In order to make satisfactory academic progress as a Computer Engineering major, a student must meet all university requirements for academic progress, and must earn a grade of C- or better in each of the “major requirements” courses. No "Major Requirements" course (as listed under Section II of the BS degree requirement) may be taken until the student has obtained a grade of C- or better in each of the prerequisites (if a higher grade requirement is stated for a specific class, the higher requirement applies).

**Bachelor of Science in Computer Engineering**

*Degree Requirements (126 semester credit hours)*

I. Core Curriculum Requirements: 42 semester credit hours

- **Communication:** 6 semester credit hours
  - RHET 1302 Rhetoric
  - ECS 3390 Professional and Technical Communication

- **Mathematics:** 3 semester credit hours
  - MATH 2417 Calculus I

- **Life and Physical Sciences:** 6 semester credit hours
  - PHYS 2325 Mechanics
  - PHYS 2326 Electromagnetism and Waves

- **Language, Philosophy and Culture:** 3 semester credit hours
  - Select any 3 semester credit hours from Language, Philosophy and Culture core courses (see advisor)
Creative Arts: 3 semester credit hours
Select any 3 semester credit hours from Creative Arts core courses (see advisor)

American History: 6 semester credit hours
Select any 6 semester credit hours from American History core courses (see advisor)

Government / Political Science: 6 semester credit hours
- GOVT 2305 American National Government
- GOVT 2306 State and Local Government

Social and Behavioral Sciences: 3 semester credit hours
- ECS 3361 Social Issues and Ethics in Computer Science and Engineering

Component Area Option: 6 semester credit hours
- MATH 2417 Calculus I
- MATH 2419 Calculus II
- PHYS 2125 Physics Laboratory

II. Major Requirements: 77 semester credit hours

Major Preparatory Courses: 24 semester credit hours including 5 listed above in Core Curriculum
- CE 1337 Computer Science I
- ECS 1200 Introduction to Engineering and Computer Science
- CE 1202 Introduction to Electrical Engineering
- ENGR 2300 Linear Algebra for Engineers
- CE 2305 Discrete Mathematics for Computing I
- CE 2310 Introduction to Digital Systems
- CE 2336 Computer Science II
- MATH 2417 Calculus I
- MATH 2419 Calculus II
- MATH 2420 Differential Equations with Applications
- PHYS 2125 Physics Laboratory
Major Core Courses: 53 semester credit hours beyond Core Curriculum

CE 3101 Electrical Network Analysis Laboratory
CE 3102 Signals and Systems Laboratory
CE 3110 Electronic Devices Laboratory
CE 3111 Electronic Circuits Laboratory
CE 3120 Digital Circuits Laboratory
ECS 3361 Social Issues and Ethics in Computer Science and Engineering
ECS 3390 Professional and Technical Communication
ENGR 3300 Advanced Engineering Mathematics
CE 3301 Electrical Network Analysis
CE 3302 Signals and Systems
CE 3310 Electronic Devices
CE 3311 Electronic Circuits
CE 3320 Digital Circuits
ENGR 3341 Probability Theory and Statistics
CE 3345 Data Structures and Introduction to Algorithmic Analysis
CE 3354 Software Engineering
CE 4304 Computer Architecture
CE 4337 Organization of Programming Languages
CE 4348 Operating Systems Concepts
CE 4370 Embedded Microprocessor Systems
CE 4388 Senior Design Project I
CE 4389 Senior Design Project II
CE 4390 Computer Networks

III. Elective Requirements: 7 semester credit hours
Free Electives: 7 semester credit hours

Both lower- and upper-division courses may count as free electives, but students must complete at least 51 semester credit hours of upper-division courses to qualify for graduation.

Degree programs in the Erik Jonsson School of Engineering and Computer Science are governed by various accreditation boards that place restrictions on classes used to meet the curricular requirements of degrees they certify. For this reason, not all classes offered by the university can be used to meet elective requirements. Please check with your academic advisor before enrolling in classes you hope to use as free electives.

Fast Track Baccalaureate/Master’s Degrees

In response to the need for advanced education in computer engineering, a Fast Track program is available to well-qualified UT Dallas undergraduate students. The Fast Track program is designed to accelerate a student’s education so that both a BS and an MS degree can be earned in five years of full-time study. This is accomplished by (1) taking courses (typically electives) during one or more summer semesters, and (2) beginning graduate coursework during the senior year. Details are available from the Associate Dean for Undergraduate Education.

Honors Program

The Computer Engineering Program offers upper-division Honors for outstanding students in the BS Computer Engineering degree program. This program offers special sections of designated classes and other activities designed to enhance the educational experience of exceptional students. Admission to the Honors programs requires a 3.500 or better GPA in at least 30 semester credit hours of coursework. Graduation with Honors requires a 3.500 or better GPA and completion of at least 6 honors classes. These honors classes must include either Senior Honors in Computer Engineering (CE 4399) or Undergraduate Research in Computer Engineering (CE 4V98) and a Senior Honors Thesis must be completed within one of those two classes. (While the topics may be related, the Senior Thesis does not replace the need for the student to complete a regular Senior Design Project.) The other 5 honors classes can come from a mixture of Graduate level (up to a count of 4) classes and special honor sections of regular undergraduate CE classes (up to a count of 2). Current undergraduate honors courses include but are not limited to: CE 2310 (H), ENG R 4334, CE 4372, CE 4399, and CE 4V98. Course grades in the 6 honor classes used to determine Honors status must be B- or higher to qualify.

Departmental Honors with Distinction may be awarded to students whose Senior Honors Thesis is judged by a faculty committee to be of exemplary quality. Only students graduating with Departmental Honors are eligible. Thesis/projects must be submitted by the deadline that applies to MS Theses in the graduating semester to allow for proper evaluation. Students interested in Honors with Distinction are encouraged to start working on their thesis/project a year prior to graduation.
Minors

The School of Engineering and Computer Science does not offer a minor in Computer Engineering at this time.

1. Incoming freshmen must complete and pass UNIV 1010 Freshman Seminar and the corresponding school-related freshman seminar course. Erik Jonsson School of Engineering and Computer Science majors must enroll and receive credit for ECS 1200 which will satisfy the UNIV 1010 graduation requirement. Students, including transfer students, who complete their core curriculum at UT Dallas must take UNIV 2020.

2. Curriculum Requirements can be fulfilled by other approved courses. The courses listed are recommended as the most efficient way to satisfy both Core Curriculum and Major Requirements at UT Dallas.

3. Semester credit hours fulfill the communication component of the Core Curriculum.

4. Three semester credit hours of Calculus are counted under Mathematics Core, and five semester credit hours of Calculus are counted as Component Area Option Core.

5. Six semester credit hours of Physics are counted under Science core, and one semester credit hour of Physics (PHYS 2125) is counted as Component Area Option Core.

6. Semester credit hours contribute to the Social and Behavioral Sciences component of the Core Curriculum.

7. Transfer students with sufficient background may petition to substitute upper-division semester credit hours in the major for this class.