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.

Mission of the Computer Engineering (CE) Program

The focus of the Computer Engineering degree is to provide excellent education in modern computer engineering practice. Our graduates are uniquely qualified for rewarding and successful careers in materials, devices, circuits, digital systems, signal processing, and communications. In the spring of 2005 the CE faculty adopted a new set of Program Educational Objectives that refined the prior objectives and established measurements and benchmarks to monitor progress. A feedback mechanism using Alumni Surveys (by the ECS Office of Assessment) and other tools are used to measure progress toward these objectives.
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

One broad goal for the Erik Jonsson School is an excellent education for our students.

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)

Affiliated Faculty


Professor Emeritus: William J. Pervin

Associate Professors: Jorge A. Cobb, Neeraj Mittal, Issa M. S. Panahi

Assistant Professors: Joseph Callenes-Sloan, Nicholas Gans, Myoungsoo Jung, Zhiqiang Lin, Cong Liu, Jun Wang

Senior Lecturers: Chris I. Davis, Nathan B. Dodge, Greg Ozbirn, William (Bill) Swartz, rag150330

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

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 1100** Introduction to Computer Engineering
- **CE 1202** Introduction to Electrical Engineering II
- **CE 1337** Computer Science I
- **ECS 1100** Introduction to Engineering and Computer Science
- **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 I
PHYS 2126 Physics Laboratory II
PHYS 2325 Mechanics
PHYS 2326 Electromagnetism and Waves

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
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. Qualified seniors may take up to 15 graduate semester credit hours that may be used to complete the baccalaureate degree and also to satisfy the requirements for the master's degree. 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 Departmental Honors for outstanding students in the BS Computer Engineering degree program. Admission to the Honors programs requires that the student meet the following qualifications:

- Has repeated no more than 3 courses at UT Dallas and has repeated no course more than once.

Graduation with Honors requires a 3.500 or better GPA and completion of either Senior Honors in Computer Engineering (CE 4399) or Undergraduate Research in Computer Engineering (CE 4V98). 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).

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 enroll and complete requirements of UNIV 1010 and the corresponding school-related freshman seminar course. 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.