

Erik Jonsson School of Engineering and Computer Science

Department of Electrical and Computer Engineering

Electrical Engineering (BSEE)

The Electrical and Computer Engineering Department offers a [Bachelor of Science in Electrical Engineering](#). The Electrical Engineering program offers students an opportunity to acquire a solid foundation in the broad areas of electrical engineering and emphasizes advanced study in digital systems, digital signal processing, communications, analog systems, RF/microwave, and microelectronics.

The Electrical Engineering program offers students a solid educational foundation in the areas of electrical networks, electronics, electromagnetics, computers, digital systems, and communications and is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (ABET). Mastery of these areas provides students with the ability to adapt and maintain leadership roles in their post- baccalaureate pursuits through the application of fundamental principles to a rapidly changing and growing discipline.

Students in the Electrical Engineering program a broad general program in electrical engineering and can then take advanced courses in computer hardware and software; the analysis and design of analog and digital communication systems; analog and digital signal processing; the analysis, design, and fabrication of microelectronic components and systems; and guided and unguided wave propagation. A broad choice of electives (within and external to electrical engineering) allows students to broaden their education as well as develop expertise in areas of particular interest. In keeping with the role of a professional, students are expected to develop communication skills and an awareness of the relationship between technology and society.

The Electrical Engineering program is based on a solid foundation of science and mathematics coursework. Students in this program are given an opportunity to learn and extend their abilities to analyze and solve complex problems and to design new uses of technology to serve today's society. The engineering programs at UT Dallas provide an integrated educational experience directed toward the development of the ability to apply pertinent knowledge to the identification and solution of practical problems in Electrical and other related engineering fields. These programs ensure that the design experience, which includes both analytical and experimental studies, is integrated throughout the curriculum 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 industry serve to further supplement

design experiences.

Mission of the Electrical Engineering Program

The mission of the Electrical Engineering Program is to provide excellent education in modern electrical engineering practice. Our graduates are highly qualified for rewarding and successful careers in a diverse range of electrical engineering fields.

Program Educational Objectives for Electrical Engineering

The UT Dallas Electrical Engineering Program educational objectives will enable our graduates within a few years of graduation to:

- Successfully pursue a diverse range of careers as electrical engineers, consultants, educators, and/or entrepreneurs as well as pursue advanced education.
- Be effective contributors and leaders in both professional and personal settings.
- Serve their profession and/or employer in a responsible, ethical, creative, and enthusiastic manner to meet the needs of industry and society
- Continue to learn and improve through self-motivation.

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 to move immediately into demanding college courses in calculus, calculus-based physics, and chemistry for science majors. 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 Electrical 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 Electrical Engineering is accredited by the Engineering Accreditation Commission of ABET, www.abet.org.

Academic Progress in Electrical Engineering

In order to make satisfactory academic progress as an Electrical 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 BSEE 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 Electrical Engineering

[Degree Requirements](#) (128 semester credit hours)¹

[View an Example of Degree Requirements by Semester](#)

Faculty

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Professors: Naofal Al-Dhahir, Poras T. Balsara, Dinesh Bhatia, Yun Chiu, Babak Fahimi, John P. Fonseka, William R. Frensley, Andrea Fumagalli, John H. L. Hansen, C. Robert Helms, Wenchuang (Walter) Hu, Nasser Kehtarnavaz, Kamran Kiasaleh, Gil S. Lee, Hoi Lee, Jeong-Bong Lee, Jin Liu, Dongsheng (Brian) Ma, Giorgos (Yiorgos) Makris, Hlaing Minn, Aria Nosratinia, Mehrdad Nourani, Kenneth K. O, Lawrence J. Overzet, Issa M. S. Panahi, Mohammad Saquib, Carl Sechen, Mark W. Spong, Lakshman Tamil, Murat Torlak, Dian Zhou

Associate Professors: Bilal Akin, Carlos A. Busso-Recabarren, Rashaunda Henderson, Chin-Tuan Tan, Chadwin D. Young

Assistant Professors: Benjamin Carrion Schafer, Joseph Friedman, Ghanshyamsinh Gohil, Qing Gu, Yang Hu, Jae Mo Park

Professors Emeritus: Andrew J. Blanchard, Louis R. Hunt, Duncan L. MacFarlane, William J. Pervin, Don Shaw

Associate Professor Emeritus: Gerald O. Burnham

Senior Lecturers: Md Ali, Diana Cogan, James Florence, Matthew Heins, Jung Lee, Randall E. Lehmann, Rabah Mezenner, Miguel Razo-Razo, Ricardo E. Saad, Neal Skinner, William (Bill) Swartz, Marco Tacca

Research Professors: Andrew Marshall, Hisashi (Sam) Shichijo

UT Dallas Affiliated Faculty: Larry P. Ammann, Leonidas Bleris, Yves J. Chabal, Wonjae Choi, Massimo V. Fischetti, Matthew J. Goeckner, Robert D. Gregg, Zygmunt Haas, Kenneth Hoyt, Russell A. Hulse, Jiyoung Kim, Moon J. Kim, David J. Lary, Yaoyu Li, Yang Liu, Ann Majewicz Fey, S.O. Reza Moheimani, Wooram Park, Robert L. Rennaker II, Fabiano Rodrigues, Mario A. Rotea, Justin Ruths, Tyler Summers, Yonas Tadesse, William Vandenberghe, Mathukumalli Vidyasagar, Amy V. Walker, Robert M. Wallace, Steve Yurkovich, Jie Zhang

I. Core Curriculum Requirements: 42 semester credit hours²

Communication: 6 semester credit hours

[RHET 1302](#) Rhetoric

[ECS 3390](#) Professional and Technical Communication³

Mathematics: 3 semester credit hours

[MATH 2417](#) Calculus I⁴

Life and Physical Sciences: 6 semester credit hours

[PHYS 2325](#) Mechanics⁵

[PHYS 2326](#) Electromagnetism and Waves⁵

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

Select any 3 semester credit hours from [Social and Behavioral Sciences Core](#) courses (see advisor)

Component Area Option: 6 semester credit hours

[MATH 2417](#) Calculus I₄

[MATH 2419](#) Calculus II₄

[PHYS 2125](#) Physics Laboratory I₅

II. Major Requirements: 77 semester credit hours₆

Major Preparatory Courses: 22 semester credit hours beyond Core Curriculum

[CHEM 1111](#) General Chemistry Laboratory I

[CHEM 1311](#) General Chemistry I

[CS 1325](#) Introduction to Programming

[EE 1100](#) Introduction to Electrical and Computer Engineering₇

[ECS 1100](#) Introduction to Engineering and Computer Science

[EE 1202](#) Introduction to Electrical Engineering II₇

[ENGR 2300](#) Linear Algebra for Engineers

[EE 2310](#) Introduction to Digital Systems

[MATH 2417](#) Calculus I₄

[MATH 2419](#) Calculus II₄

[MATH 2420](#) Differential Equations with Applications

[PHYS 2125](#) Physics Laboratory I₅

[PHYS 2126](#) Physics Laboratory II

[PHYS 2325](#) Mechanics₅

[PHYS 2326](#) Electromagnetism and Waves⁵

Major Core Courses: 40 semester credit hours beyond Core Curriculum

[EE 3161](#) Social Issues and Ethics in Engineering

[ECS 3390](#) Professional and Technical Communication³

[EE 3201](#) Electrical and Computer Engineering Fundamentals-I Laboratory

[EE 3202](#) Electrical and Computer Engineering Fundamentals-II Laboratory

[ENGR 3300](#) Advanced Engineering Mathematics

[EE 3301](#) Electrical Network Analysis

[EE 3302](#) Signals and Systems

[EE 3310](#) Electronic Devices

[EE 3311](#) Electronic Circuits

[EE 3320](#) Digital Circuits

[ENGR 3341](#) Probability Theory and Statistics

[EE 4301](#) Electromagnetic Engineering I

[EE 4310](#) Systems and Controls

[EE 4370](#) Embedded Systems

[EE 4388](#) Senior Design Project I

[EE 4389](#) Senior Design Project II

Select one of the following laboratories:

[EE 4201](#) Electrical and Computer Engineering Laboratory in Computing Systems and Computer Engineering

[EE 4202](#) Electrical and Computer Engineering Laboratory in Circuits

[EE 4203](#) Electrical and Computer Engineering Laboratory in Signals and Systems

[EE 4204](#) Electrical and Computer Engineering Laboratory in Devices

[EE 4205](#) Electrical and Computer Engineering Laboratory in Power Electronics and Energy Systems

Major Guided Electives: 12 semester credit hours

Students pursuing the general program take 12 semester credit hours from any other 4000 level or higher Electrical Engineering courses. Independent Study in Electrical Engineering ([EE 4V97](#)), Undergraduate Research in Electrical Engineering ([EE 4V98](#)), or Senior Honors in Electrical Engineering ([EE 4399](#)) may be used for up to 6 of these hours.

Students pursuing a concentration in one of the following areas should take a minimum of two courses in that area:

Circuits

[EE 4168](#) RF/Microwave Laboratory

[EE 4325](#) Introduction to VLSI Design

[EE 4340](#) Analog Integrated Circuit Analysis and Design

[EE 4368](#) RF Circuit Design Principles

[EE 4V95](#) Undergraduate Topics in Electrical Engineering

[EE 4202](#) Electrical and Computer Engineering Laboratory in Circuits

Computing Systems

[EE 4304](#) Computer Architecture

[EE 4V95](#) Undergraduate Topics in Electrical Engineering

[EE 4201](#) Electrical and Computer Engineering Laboratory in Computing Systems and Computer Engineering

Devices

[EE 4330](#) Integrated Circuit Technology

[EE 4391](#) Technology of Plasma

[EE 4371](#) Introduction to MEMs

[EE 4V95](#) Undergraduate Topics in Electrical Engineering

[EE 4204](#) Electrical and Computer Engineering Laboratory in Devices

Power Electronics and Energy Systems

[EE 4362](#) Introduction to Energy Conversion

[EE 4363](#) Introduction to Power Electronics

[EE 4V95](#) Undergraduate Topics in Electrical Engineering

[EE 4205](#) Electrical and Computer Engineering Laboratory in Power Electronics and Energy Systems

Signals and Systems

[EE 3350](#) Communications Systems

[EE 4360](#) Digital Communications

[EE 4361](#) Introduction to Digital Signal Processing

[EE 4365](#) Introduction to Wireless Communication

[EE 4367](#) Telecommunications Networks

[EE 4342](#) Introduction to Robotics

[EE 4V95](#) Undergraduate Topics in Electrical Engineering

[EE 4203](#) Electrical and Computer Engineering Laboratory in Signals and Systems

III. Elective Requirements: 9 semester credit hours

Free Electives: 9 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 electrical 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 Department of Electrical and Computer Engineering offers Departmental Honors for outstanding students in the BS Electrical 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 Electrical Engineering ([EE 4399](#)) or Undergraduate Research in Electrical Engineering ([EE 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 Department of Electrical and Computer Engineering does not offer minors 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 (PHYS 2325 and PHYS 2326) are counted under Science Core and one semester credit hour (PHYS 2125) is counted under the Component Area Option Core.

6. Students must pass each of the EE, CS, Math and Science courses listed in this degree plan and each of their prerequisites, with a grade of C- or better.

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

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