

SPRING	HOURS
CSCE 3020, Fundamentals of Communication Theory	3
CSCE 3730, Reconfigurable Logic	3
EENG 3510, Electronics I (Devices and Materials)	3
PSCI 1050, American Government*	3
CSCE Specialty Area (advanced)	<u>3</u>
Total	15
SENIOR YEAR	HOURS
FALL	HOURS
CSCE 4910, Computer Engineering Design I	3
CSCE Specialty Area (advanced)	3
Mathematics or Science Elective (advanced)	3
Visual and Performing Arts*	3
Wellness*	<u>3</u>
Total	15
SPRING	HOURS
CSCE 4915, Computer Engineering Design II	3
CSCE Specialty Area Elective (advanced)	3
Cross-Cultural, Diversity and Global Studies*	3
Humanities*	3
Technical Elective (advanced)	<u>3</u>
Total	15

*See the University Core Curriculum section of this catalog for approved list of course options.

** See College of Engineering degree requirements section of this catalog for approved list of course options.

Actual degree plans may vary depending on availability of courses in a given semester.

Some courses may require prerequisites not listed.

Minor in Computer Science

A minor in computer science consists of a minimum of 18 semester hours of computer science courses, including 6 advanced hours. Required courses are CSCE 1030, 1040 and 2050. Six hours of advanced courses must be taken at UNT.

Graduate Degrees

The Department of Computer Science and Engineering offers degree programs leading to the Master of Science and Doctor of Philosophy. Graduate minors in computer science may be selected at introductory and advanced levels. For information, consult the *Graduate Catalog*.

Courses of Instruction

All Courses of Instruction are located in one section at the back of this catalog.

Course and Subject Guide

The "Course and Subject Guide," found in the Courses of Instruction section of this book, serves as a table of contents and provides quick access to subject areas and prefixes.

Department of Electrical Engineering

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Faculty

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Introduction

The Department of Electrical Engineering at the University of North Texas provides an innovative program in electrical engineering, combining cognitive skills, industry-university joint projects and business skills with courses that form the foundation of electrical engineering discipline. Combining theory and practice, the curriculum is designed to serve the citizens and industries in Texas, particularly the North Texas region, and the nation.

The department is housed in a brand new facility designed to promote intellectual and scholarly endeavors of faculty and students. The department currently offers a Bachelor of Science degree and plans to offer a Master of Science degree beginning in 2007. There are currently six faculty members, and the department is actively recruiting several additional outstanding faculty. Research interests of the faculty include digital signal processing, radar and image processing, pattern recognition and wireless sensor networks.

The department received support from the National Science Foundation to offer an "Innovative Design- and Project-Oriented Electrical Engineering Program" under the Department-Level Reform initiative.

Mission

The mission of the Department of Electrical Engineering conforms to the mission of the College of Engineering through commitment to innovation and excellence in teaching, research and service. In

order to meet this objective, the primary goals of the department are:

- to provide high quality innovative educational programs at the undergraduate and graduate level to foster learning, ethical standards, and leadership qualities;
- to pursue excellence in scholarly research at the frontiers of electrical engineering; and
- to facilitate access through our faculty expertise and our modern facilities to serve the industry, the profession, and other constituents in North Texas, the state and the nation.

Our strategy to introduce innovations in undergraduate education is based on the following major features:

- partnership between industry and the university,
- focus on active learning and “learning to learn,” and
- emphasis on teams and laboratory activities applied to real-world problems and introduction of business practices and concepts at the undergraduate and graduate levels.

Our innovative bachelor’s program is designed to satisfy the ABET criteria for accreditation of engineering programs. In order to accomplish the educational objectives for the program our students develop:

1. An ability to apply knowledge of business principles, mathematics, science, and engineering.
2. An ability to design and conduct experiments, as well as to analyze and interpret data.
3. An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.
4. An ability to function on multi-disciplinary teams.
5. An ability to identify, formulate, and solve engineering problems.
6. An understanding of professional and ethical responsibility.
7. An ability to communicate effectively.
8. An understanding of the impact of engineering solutions in a global, economic, environmental, and societal context.
9. A recognition of the need for, and an ability to engage in life-long learning.
10. A knowledge of contemporary issues.
11. An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

We ensure that our undergraduate courses satisfy one or more of the above criteria in addition to enriching our students’ educational experience at UNT.

In order to accomplish the objectives in pursuing excellence in scholarly and applied research, the faculty of the department is committed to:

- establishing high standards for research and scholarship,
- fostering excellence and diversity in research,
- creating an inspiring academic environment for the students through integration of research and education, and
- serving the society and the profession through technological advances in basic and applied research.

Programs of Study

The department currently offers an undergraduate program in the following area:

- Bachelor of Science with a major in electrical engineering.

Bachelor of Science with a Major in Electrical Engineering

The Bachelor of Science degree with a major in electrical engineering is an innovative undergraduate program designed to combine the best practices in electrical engineering education. This design- and project-oriented program integrates concepts, analysis, design and development of state-of-the-art electrical and electronic systems. Through course work, students have “learning-to-learn” experiences and projects that are taught jointly by industry and university personnel. This active learning experience emphasizes knowledge and skills so that students can solve real-world electrical engineering problems. The one-year sequence of business and marketing courses encourages students to develop a global markets outlook.

The course work in electrical engineering covers broad areas in electronics, communication systems, computer systems, VLSI design, electromagnetics and signal processing. The design projects are integrated into the course work so that students can learn to solve practical engineering problems in a creative and relevant setting. In addition, the course work ensures that students have an opportunity to solve multidisciplinary engineering problems by working in teams and to develop effective oral and written communication skills.

The program also puts a strong emphasis on studies in art, business, management, humanities, physics and chemistry, social sciences, professionalism and engineering ethics, which fulfill objectives appropriate to the electrical engineering profession.

The bachelor of science degree with a major in electrical engineering is a new program designed to meet ABET criteria. Accreditation for this degree will be sought as soon as the program graduates its first class of students.

Degree Requirements

- Hours Required and General/College Requirements:** A minimum of 135 semester hours, of which 42 must be advanced, and fulfillment of degree requirements for the Bachelor of Science degree as specified in the "General University Requirements" in the Academics section of this catalog and the College of Engineering requirements.
- Major Requirements:** A minimum of 36 semester hours, including EENG 2610, 2620, 2710, 3410, 3510, 3520, 3710, 3810, 4710 and 4810; two elective courses, EENG 4010 and 4020; completion of 22 semester hours of project courses, EENG 1910, 1920, 2910, 2920, 3910, 3920, 4910 and 4990.
- Other Required Courses:**
 - MATH 1710, 1720, 1780, 2700, 2730 and 3410.
 - CHEM 1410/1430, PHYS 1710/1730, PHYS 2220/2240.
 - CSCE 1020.
 - MGMT 3830, 3850.
- Minor:** Optional.
- Electives:** See four-year plan.
- Other Requirements:** A grade point average of at least 2.5 is required for all electrical engineering courses.

BS with a Major in Electrical Engineering

Following is one suggested four-year degree plan. Students are encouraged to see their adviser each semester for help with program decisions and enrollment. Students are responsible for meeting all course prerequisites.

FRESHMAN YEAR

FALL	HOURS
CHEM 1410, General Chemistry for Science Majors	3
CHEM 1430, General Chemistry Laboratory	1
CSCE 1020, Program Development	4
EENG 1910, Project I	2
ENGL 1310, College Writing I or ENGL 1313, Computer Assisted College Writing I*	3
MATH 1710, Calculus I	4
Total	17

SPRING	HOURS
EENG 1920, Project II	2
EENG 2710, Digital Logic Design	3
ENGL 2700, Technical Writing**	3
MATH 1720, Calculus II	3
PHYS 1710, Mechanics	3
PHYS 1730, Laboratory in Mechanics	1
MGMT 3830, Operations Management	3
Total	18

SOPHOMORE YEAR

FALL	HOURS
EENG 2610, Circuit Analysis	3
EENG 2910, Project III	3
HIST 2610, United States History to 1865*	3
MATH 3310, Differential Equations for Engineering Majors	3
PHYS 2220, Electricity and Magnetism	3
PHYS 2240, Laboratory in Wave Motion, Electricity, Magnetism and Optics	1
Total	16

SPRING	HOURS
EENG 2620, Signals and Systems	3
EENG 2920, Project IV	3
HIST 2620, United States History Since 1865*	3
MATH 1780, Probability Models	3
MGMT 3850, Entrepreneurship	3
PSCI 1040, American Government I*	3
Total	18

JUNIOR YEAR

FALL	HOURS
EENG 3410, Engineering Electromagnetics	3
EENG 3510, Electronics I	3
EENG 3910, Project V	3
ENGR 2060, Professional Presentations (may be used to satisfy Communication requirement*)	3
MATH 2700, Linear Algebra and Vector Geometry	3
PSCI 1050, American Government II*	3
Total	18

SPRING	HOURS
EENG 3520, Electronics II (Circuits and Applications)	3
EENG 3710, Computer Organization	3
EENG 3810, Communication Systems	3
EENG 3920, Project VI	3
MATH 2730, Multivariable Calculus Cross-Cultural, Diversity and Global Studies*	3
Total	18

SENIOR YEAR

FALL	HOURS
EENG 4010, Advanced Topics in Electrical Engineering I	3
EENG 4710, VLSI Design	3
EENG 4910, Project VII	3
Visual and Performing Arts*	3
Wellness*	3
Total	15

SPRING	HOURS
EENG 4020, Advanced Topics in Electrical Engineering II	3
EENG 4810, Computer Networks	3
EENG 4990, Project VIII	3
Humanities*	3
Social and Behavioral Sciences*	3
Total	15

**See the University Core Curriculum section of this catalog for approved list of course options.*

*** See College of Engineering degree requirements section of this catalog for approved list of course options.*

Actual degree plans may vary depending on availability of courses in a given semester.

Some courses may require prerequisites not listed.

Dual Degree Program

Bachelor of Science with a Major in Electrical Engineering and Bachelor of Science with a Major in Mathematics

The dual degree program in mathematics and engineering combines the strengths of Texas Woman's University (TWU) and University of North Texas to permit students to earn two degrees simultaneously while preparing for a professional career in engineering.

Undergraduate students attend TWU for three years as mathematics majors in the Department of Mathematics and Computer Science, then continue their education in the College of Engineering at UNT for approximately two additional years. After completion of the program, students receive the Bachelor of Science degree with a major in mathematics from TWU and the Bachelor of Science degree with a major in electrical engineering from UNT.

The following outline of courses is designed to satisfy the requirements of the TWU undergraduate core curriculum and of a Bachelor of Science degree in mathematics. Additional courses will be required by UNT. For the TWU degree, a total of at least 124 hours is required, including 36 advanced hours. Certain course work completed at UNT will be taken in transfer to complete the TWU degree. Interested students should consult the current undergraduate catalog for details regarding the TWU Undergraduate Core Curriculum. The minor suggested in the mathematics degree at TWU is computer science. However, the engineering major selected at UNT may serve as the minor for the TWU degree. If the degree in engineering at UNT is not completed, the student may complete TWU degree in mathematics with appropriate additional work.

Scholarships and/or summer employment are available for the academically able student. Through TWU's Cooperative Education program, students may earn academic credit and income while gaining on-the-job experience related to engineering.

A 2.5 grade point average (GPA) is the minimum criterion for transfer admission consideration into most UNT engineering programs after completion of the first three years of work at TWU. Those applicants who have completed all foundation courses for engineering (see UNT catalog), have a 2.5 GPA in the foundation course work and a 2.5 GPA in all transferable work, will be admitted upon application to UNT. No grade lower than C is accepted in any mathematics or computer science courses at TWU. While a 2.0 GPA is the UNT requirement for admission after completion of 60 semester credit hours at TWU, a 2.5 is required for admission into UNT College of Engineering degree programs. Students may apply for concurrent enrollment at UNT prior to completion of their work at TWU by using the appropriate application and following the admissions procedure listed in the UNT catalog.

Suggested Courses

The courses listed below will be accepted by the College of Engineering at University of North Texas for those students who successfully transfer from Texas Woman's University into Electrical Engineering within the College of Engineering, provided the student has duly received credit for the courses at TWU. The student should work closely with academic advisers at TWU and UNT to assure that he or she has satisfied core curriculum at both universities.

At TWU, students take a broad range of courses in mathematics, computer science, humanities, social and natural sciences, as well as the basic introductory courses needed to enter studies in engineering.

BS with a Major in Electrical Engineering/ BS with a Major in Mathematics

Following is one suggested five-year degree plan. Students are encouraged to see their adviser each semester for help with program decisions and enrollment. Students are responsible for meeting all course prerequisites.

FIRST YEAR (TWU)*		HOURS
FALL		
Total		17
SPRING		HOURS
Total		18
SECOND YEAR (TWU)*		HOURS
FALL		
Total		15

SPRING	HOURS	
Total	19	
THIRD YEAR (TWU)*		
FALL	HOURS	
Total	18	
SPRING	HOURS	
Total	18	
FOURTH YEAR (UNT)		
FALL	HOURS	
ENGL 2700, Technical Writing	3	
EENG 1910, Project I – Learning to Learn	2	
EENG 2610, Circuit Analysis	3	
EENG 2910, Project III	3	
MGMT 3830, Operations Management	<u>3</u>	
Total	14	
SPRING	HOURS	
EENG 1920, Project II – Engineering Ethics and Professionalism	2	
EENG 2620, Signals and Systems	3	
EENG 2920, Project IV	3	
EENG 3410, Engineering Electromagnetics	3	
EENG 3510, Electronics I	<u>3</u>	
Total	14	
SUMMER	HOURS	
EENG 3910, Project V	3	
ENGR 2060, Professional Presentations	<u>3</u>	
Total	6	
FIFTH YEAR (UNT)		
FALL	HOURS	
EENG 3520, Electronics II	3	
EENG 3710, Computer Organization	3	
EENG 3810, Communication Systems	3	
EENG 3920, Project VI	3	
MGMT 3850, Entrepreneurship	<u>3</u>	
Total	15	
SPRING	HOURS	
EENG 4010, Advanced Topics in Electrical Engineering I	3	
EENG 4020, Advanced Topics in Electrical Engineering II	3	
EENG 4710, VLSI Design	3	
EENG 4810, Computer Networks	3	
EENG 4910, Project VII	<u>3</u>	
Total	15	
SUMMER	HOURS	
EENG 4920, Project VIII	<u>3</u>	
Total	3	

***See the Texas Woman's University catalog for degree requirements for the Bachelor of Science with a major in mathematics.**

**** Confer with academic adviser for specific course.**

*Actual degree plans may vary depending on availability of courses in a given semester.
Some courses may require prerequisites not listed.*

Graduate Degrees

The Department of Electrical Engineering offers a degree program leading to the Master of Science. For information, consult the *Graduate Catalog*.

Courses of Instruction

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Introduction

Engineering technology is the profession in which a knowledge of mathematics and natural sciences gained by higher education, experience and practice is devoted primarily to the implementation and extension of existing technology for the benefit of humanity (Engineering Technology Council, 1994). Increasing technological aspects of all modern activities have