Bachelor of Science in Electrical Engineering

About This Program

Electrical Engineering is a cross-cutting field that includes power systems, control systems, microelectronics and nanoelectronics, embedded systems and computer networks, communications (wireless, including cellular and satellite, and wired/fiber optic), remote sensing, signal and data processing, optics (electro-optics, optoelectronics and photonics) and other emerging technologies. Modern applications include renewable energy sources and microgrids, 4G and 5G cellular phones and base stations, Internet of Things (IoT), machine learning, deep learning (such as neural networks), medical devices and instruments, electric vehicles, vehicular networking, and assisted/autonomous vehicles (including drones and robots), and many others.

Electrical engineers must be prepared to apply fundamental concepts in the applications of new technologies and to contribute to the growth of these technologies. They must also have the skills to communicate their ideas and to manage projects within a schedule and budget. Because of the broad nature of the field, electrical engineers are involved in a wide range of engineering design projects and they must be able to employ knowledge from other disciplines in electrical engineering designs. They must also be prepared to support engineers in other disciplines.

Engineering designs are a team effort and require good communication skills, both oral and written. Therefore it is important that each student develops these necessary communication skills.

The benefit of having an education in electrical engineering is that the student is prepared for a career not only in technical areas but also for further training in other disciplines that require strong organizational and analytical skills such as medicine, law, public policy, business, economics, management, and teaching.

ABET ACCREDITATION

The Electrical Engineering BS is accredited by the Engineering Accreditation Commission (EAC) of ABET (https://www.abet.org/) under the commission's General Criteria and the Program Criteria for Electrical Engineering and Similarly Named Engineering programs. The Electrical Engineering program has been accredited since 1965.

PROGRAM EDUCATIONAL OBJECTIVES

The programs is designed so that a few years following graduation students will be able to:

- Advance the mission of their organization by innovative solutions to any of the following disciplines: component and/or system design, R&D, manufacturing, application engineering, technical training, sales and marketing, quality control and testing.
- Demonstrate leadership in one or more significant roles since graduation, as evidenced for example by successful entrepreneurship in a start-up, significant promotions and awards in a company or engineering firm.
- Successfully build on the BSEE degree from UTA to enhance career development or in pursuit of academic roles: this may be via completing a graduate degree; or taking professional course(s); or earning professional certificate(s).

STUDENT OUTCOMES

Upon completion of the degree, students will be able to:

1. Identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. Apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
3. Communicate effectively with a range of audiences.
4. Recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
5. Function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
6. Develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
7. Acquire and apply new knowledge as needed, using appropriate learning strategies.

Admissions Criteria

Requirements for admission as an EE major are governed by the requirements as stated in the College of Engineering section of this catalog. EE majors are only allowed to enroll in pre-professional courses until they meet the requirements for the professional program.

ADVANCEMENT INTO ELECTRICAL ENGINEERING PROFESSIONAL PROGRAM

Requirements for admission to the professional program in Electrical Engineering are in accordance with those of the College of Engineering with the following added stipulations:

- Application to the professional program is to be made to the Undergraduate Advisor during the semester that the advancement requirements are being completed.
- No professional electrical engineering courses may be taken until the student is admitted into the professional program or obtains the written consent of the Undergraduate Advisor.
- Each student must have a total of no more than four unsuccessful attempts in engineering courses and complete all pre-professional courses stipulated under "Requirements for a Bachelor of Science Degree in Electrical Engineering" with a minimum grade of C in each course and a minimum GPA of 2.50 in:
  - all courses,
  - in all math, science, and engineering courses, and
  - in all EE courses.

Curriculum

Foundations		
General Core Requirements (https://catalog.uta.edu/academicregulations/degreerequirements/generalcorerequirements/)		42
Students are required to complete specific courses in certain core areas. Those included in the preprofessional program are identified with a footnote.		
In addition to the specified courses, students must chose 6 hours of U.S. History, 6 hours of Government/Political Science, 3 hours of Language, Philosophy, Culture, and 3 hours of Creative Arts from the general education core.		
For Communication select:		
ENGL 1301	RHETORIC AND COMPOSITION I [1]	
ENGL 1302	RHETORIC AND COMPOSITION II [1]	
For Mathematics select:		
MATH 1426	CALCULUS I [1, 2]	
MATH 2425	CALCULUS II [1]	
For Life & Physical Science select:		
PHYS 1443	GENERAL TECHNICAL PHYSICS I [1]	
PHYS 1444	GENERAL TECHNICAL PHYSICS II [1]	
For Social & Behavioral Science select:		
ECON 2305	PRINCIPLES OF MACROECONOMICS	
For Foundational Component Area option select:		
COMS 2302	PROFESSIONAL AND TECHNICAL COMMUNICATION FOR SCIENCE AND ENGINEERING	
EE Foundations (Pre-Professional Program)		
Additional hours required in core for pre-professional courses.		4
UNIV-EN 1131	STUDENT SUCCESS	1
or ENGR 1101	ENTRANCE TO ENGINEERING FOR TRANSFER STUDENTS	
MATH 2326	CALCULUS III [1]	3
MATH 3319	DIFFERENTIAL EQUATIONS & LINEAR ALGEBRA	3
CHEM 1465	CHEMISTRY FOR ENGINEERS [4]	4
EE 1201	INTRODUCTION TO ELECTRICAL ENGINEERING	2
EE 1106	ELECTRICAL ENGINEERING FRESHMAN PRACTICUM	1
EE 1311	COMPUTING SYSTEM AND ALGORITHMIC SOLUTIONS	3
EE 2315	CIRCUIT ANALYSIS I	3
EE 2240	SOPHOMORE PROJECT LABORATORY	2
EE 2347	MATHEMATICAL FOUNDATIONS OF ELECTRICAL ENGINEERING	3
EE 2302	PRINCIPLES OF ACTIVE AND PASSIVE DEVICES	3
EE 2303	ELECTRONICS I	3
EE 2341	DIGITAL CIRCUITS AND SYSTEMS	3
EE Specialization (Professional Program) [5]		
EE 3316	CONTINUOUS AND DISCRETE SIGNALS AND SYSTEMS	3
EE 3330	PROBABILITY AND STATISTICAL METHODS	3
EE 3346	CIRCUIT ANALYSIS II	3
EE 3407	ELECTROMAGNETICS	4
EE 3318	ANALOG AND DIGITAL SIGNAL PROCESSING	3

EE 3314	FUNDAMENTALS OF EMBEDDED CONTROL SYSTEMS	3
EE 3240	JUNIOR PROJECT LABORATORY	2
EE 4240	CONCEPTS & EXERCISES IN ENGINEERING PRACTICE	2
EE 4149	ENGINEERING DESIGN PROJECT	1
MAE 3309	THERMAL ENGINEERING	3
Electives		
Select 4 Electrical Engineering Junior/Senior Elective courses.		12
Select 1 Engineering Elective course (including Electrical Engineering) with prior approval of advisor. [6]		3
Select 1 3000/4000 course in Mathematics or Science Elective with prior approval of advisor. [6]		3
Total Hours		**125**

1 Core course included in the pre-professional program.
2 The Mathematics Department requires passing a placement test provided by the Mathematics Department before enrolling.
3 For transfer students, UNIV-EN 1131 can be substituted with ENGR 1101
4 CHEM 1465 can be substituted with CHEM 1441 & CHEM 1442 (8 hours).
5 All pre-professional courses must be completed before enrolling in professional program courses.
6 Students must take pre-requisites and possibly must request approval from a non-EE engineering department or Math/Science department before taking a non-EE course for satisfaction of the elective requirement.

Total hours will depend upon prior preparation and academic qualifications. Also, students who do not have two units of high school foreign language will be required to take two courses of foreign language in addition to the previously listed requirements.

Program Completion

ACADEMIC HONESTY

The College of Engineering takes academic honesty and ethical behavior very seriously. Engineers are entrusted with the safety, health, and well being of the public. Students found guilty of academic dishonesty will be punished to the full extent permitted by the rules and regulations of UT Arlington. In particular, a student found guilty of a second offense by the Office of Community Standards will be subject to dismissal from the College of Engineering

ORAL COMMUNICATION AND COMPUTER USE COMPETENCY REQUIREMENTS

Electrical Engineering students will satisfy the Oral Communication Competency requirement by completing COMS 2302 and the Computer Use Competency requirement by completing EE 1311 and EE 1201.

ADDITIONAL REQUIREMENTS

To graduate, the student must be admitted to the professional program and have an approved degree plan on file in the Registrar's office. The degree plan is generated upon entry to the professional program. Graduating seniors should apply to graduate during the next-to-last semester. Each student must complete all professional level electrical engineering courses stipulated under "Requirements for a Bachelor of Science Degree in Electrical Engineering" with a minimum grade of C in each course. All engineering courses used on the BSEE degree plan must be C or better.

UNDERGRADUATE ADVISING

General academic advising for new students (excluding transfer course evaluation) is done during the scheduled orientation period prior to registration. Academic advising for continuing students will be done during each semester prior to registration. The dates for advising new and continuing students will be listed in the appropriate schedule of classes. Personal academic advising is available in the office of the Undergraduate Advisor during the semester by appointment. To graduate, the student must have an approved degree plan on file in the Registrar's Office.

A supplemental EE Undergraduate Program Guide is available in the Advising Office; it provides more details of the different areas of specialization in Electrical Engineering as well as on other matters relevant to completing the BSEE degree.

Advising Resources

First time in college students meet with engineering advisors in the UAEC (UAECengineering@uta.edu). Transfer students are advised prior to New Maverick Orientation by the department. Students, please read all student emails carefully and consult the department advising webpage for additional contact information and answers to common questions.

ELECTRICAL ENGINEERING

Location:

NH 501

Email:

ee_ug_advising@uta.edu

Phone:

817-272-2671

Web:

Schedule Advising (https://outlook.office365.com/owa/calendar/EEAdvising@bookings.uta.edu/bookings/)

RESOURCE AND ENERGY ENGINEERING

Location:

NH 513

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817-272-6514

Web:

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