

ELECTRICAL ENGINEERING, BACHELOR OF SCIENCE

The electrical engineering degree will prepare you for an exciting and rewarding career in a wide range of areas within the umbrella of the electrical engineering profession. Electrical engineers design and construct systems for aerospace, multimedia, telecommunications, electric power, robotics, signal processing and controls. In the aerospace arena electrical engineers develop new sensors, control and power systems. In communications, new networks are under development that will enhance both data and voice communications. Intelligent robotic systems are being developed to locate survivors in the debris from catastrophic events such as earthquakes. Electrical power systems engineering strive to develop safe, effective and efficient integration of traditional with renewable energy sources to increase capacity in the electrical power grid.

The first two years of curriculum contain the required science, mathematics, engineering, and computer science basics to prepare the student for the upper level courses. The junior and senior years of the traditional electrical engineering curriculum include 6 hours of technical electives, 3 hours of mathematics elective and 6 hours of electrical engineering electives which allow students to concentrate their studies in an area of specialization: electric power, controls and robotics, or communications. The Bachelor of Science in Electrical Engineering program is accredited by the Engineering Accreditation Commission of ABET, <http://www.abet.org>. Graduates are eligible to practice and become licensed professional engineers.

It is highly recommended that all freshmen engineering students purchase a laptop computer. The recommended laptop computer specifications are at: <https://www.atu.edu/engineering/specifications.php>.

For a detailed policy regarding transfer credit for the Electrical Engineering programs, please see the Electrical Engineering Program (<https://catalog.atu.edu/undergraduate/programs/stem/engineering-computing-sciences/electrical-engineering/>) page.

The following curriculum represents the program of study and a suggested sequence for the Bachelor of Science in Electrical Engineering degree. The student should be aware that not all courses are offered each semester and the ordering of courses is subject to change. In order to minimize scheduling difficulties, each student should schedule a special session with their advisor at the beginning of their junior year to plan the remaining coursework.

Curriculum

Program: Bachelor of Science Electrical Engineering
Major: Electrical Engineering

The matrix below is a sample plan for all coursework required for this major.

Course	Title	Hours
Freshman		
Fall		
ENGL 1013	Composition I ¹	3
FAH 1XXX	Fine Arts and Humanities Courses ¹	3
CHEM 2124 & CHEM 2120	General Chemistry I and General Chemistry I Lab	4

MATH 2914	Calculus I	4
ELEG 1011	Introduction to Electrical Engineering	1
TECH 1001	Orientation to the University	1
Hours		16
Spring		
ENGL 1023	Composition II ¹	3
COMS 1011 & COMS 1013	Programming Foundations I Lab and Programming Foundations I	4
MATH 2924	Calculus II	4
ELEG 2130 & ELEG 2134	Digital Logic Design Lab and Digital Logic Design	4
Hours		15
Sophomore		
Fall		
COMS 2203	Programming Foundations II	3
PHYS 2114 & PHYS 2000	Calculus-Based Physics I and Physics Laboratory I	4
MATH 3243	Differential Equations I	3
ELEG 2103	Electric Circuits I	3
ELEG 3133	Microprocessor Systems Design	3
Hours		16
Spring		
PHYS 2124 & PHYS 2010	Calculus-Based Physics II and Physics Laboratory II	4
MATH 2934	Calculus III	4
ELEG 2111	Electric Circuits Laboratory	1
ELEG 2113	Electric Circuits II	3
STAT 3153	Applied Statistics	3
Hours		15
Junior		
Fall		
ELEG/MCEG 3003	System Modeling and Analysis	3
ELEG 3103	Electronics I	3
ELEG 3153	Electrical Machines	3
Technical Elective ²		3
Electrical Engineering Elective ³		3
Hours		15
Spring		
ELEG 3123	Signals and Systems	3
ELEG 3143	Electromagnetics	3
ELEG 4103	Electronics II	3
ELEG/MCEG 4202	Engineering Design	2
MATH 2703	Discrete Mathematics	3
Hours		14
Senior		
Fall		
SS 1XXX	Social Science Courses ¹	3
USHG 1XXX	U.S. History and Government ¹	3
ELEG 4113	Digital Signal Processing ⁴	3
ELEG 4143	Communication Systems I	3
ELEG 4191	Electrical Design Project I	1
ELEG 4303	Control Systems	3
Hours		16
Spring		
FAH 1XXX	Fine Arts and Humanities Courses ¹	3
ELEG 4122	Electrical Systems Lab	2
ELEG 4192	Electrical Design Project II	2
Technical Elective ²		3
Electrical Engineering Elective ^{3,4}		3
Hours		13
Total Hours		120

¹ See appropriate alternatives or substitutions in "General Education Requirements (<https://catalog.atu.edu/undergraduate/general-education-requirements/>)".

² Technical Elective must be a course from Engineering, MGMT 4203 Project Management, or the Sciences (excluding courses intended for Education Majors). All electives must have approval of the Department.

³ Engineering Elective must be a 3000 or 4000 level Electrical Engineering course.

⁴ This program partners the BSEE undergraduate degree with the MSEE degree. A maximum of 12 graduate level credit hours can be counted towards both the BSEE degree in Electrical Engineering and the MSEE degree. Four graduate level courses can be used to replace four upper-division undergraduate courses as follows:

ELEG 5313 Modern Control Systems can replace ELEG 4313 Modern Control Systems

ELEG 5113 Digital Signal Processing can replace ELEG 4113 Digital Signal Processing

ELEG 5153 Communication Systems II can replace ELEG 4153 Communication Systems II

ELEG 5133 Advanced Digital Design can replace ELEG 4133 Advanced Digital Design

ELEG 5993 Special Problems in Engineering I can replace ELEG 4993 Special Problems in Engineering