DEPARTMENT OF ELECTRICAL ENGINEERING

BACHELOR OF SCIENCE IN ELECTRICAL ENGINEERING - BIOMEDICAL

The biomedical option within the electrical engineering degree program allows graduates to pursue a career in the biomedical engineering discipline or to pursue a graduate degree in biomedical engineering. An additional 15 course credit hours beyond the 122 required for the degree will qualify graduates to apply for a post graduate medical degree program. 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 Programs page.

The following curriculum represents the program of study and a suggested sequence for the Bachelor of Science in Electrical Engineering degree with the biomedical engineering option. 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 with Biomedical Option

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

Freshman

Fall	Credits
ENGL 1013 Composition I[1]	3
BIOL 1114 Principles of Biology	4
MATH 2914 Calculus I	4
CHEM 2124 General Chemistry I and CHEM 2120 General Chemistry I Lab	4
ELEG 1011 Introduction to Electrical Engineering	1
TECH 1001 Orientation to the University	1
Total Hours	**17**

Spring	Credits
ENGL 1023 Composition II[1]	3
BIOL 2014 Human Anatomy	4
MATH 2924 Calculus II	4
CHEM 2134 General Chemistry II and CHEM 2130 General Chemistry II Lab	4
Total Hours	**15**

Sophomore

Fall	Credits
CHEM 3254 Fundamentals of Organic Chemistry	4
MATH 3243 Differential Equations I	3

Fall	Credits
PHYS 2114 Calculus-Based Physics I and PHYS 2000 Physics Laboratory I	4
ELEG 2103 Electric Circuits I	3
Total Hours	**14**

Spring	Credits
USHG 1XXX U.S. History and Government[1]	3
SOC 1003 Introductory Sociology	3
COMS 1011 Programming Foundations I Lab and COMS 1013 Programming Foundations I	4
ELEG 2111 Electric Circuits Laboratory	1
ELEG 2113 Electric Circuits II	3
Total Hours	**14**

Junior

Fall	Credits
MATH 2703 Discrete Mathematics	3
MATH 2934 Calculus III	4
PHYS 2124 Calculus-Based Physics II and PHYS 2010 Physics Laboratory II	4
ELEG 3103 Electronics I	3
Total Hours	**14**

Spring	Credits
ELEG 3123 Signals and Systems	3
ELEG 3143 Electromagnetics	3
STAT 3153 Applied Statistics	3
ELEG 4103 Electronics II	3
ELEG 4122 Electrical Systems Lab	2
ELEG 4202 Engineering Design / MCEG 4202 Engineering Design	2
Total Hours	**16**

Senior

Fall	Credits
PSY 2003 General Psychology	3
ELEG 2130 Digital Logic Design Lab and ELEG 2134 Digital Logic Design	4

Fall	Credits
ELEG 3003 System Modeling and Analysis / MCEG 3003 System Modeling and Analysis	3
ELEG 4113 Digital Signal Processing [2]	3
ELEG 4143 Communication Systems I	3
ELEG 4191 Electrical Design Project I	1
Total Hours	**17**

Spring	Credits
FAH 1XXX Fine Arts and Humanities Courses[1]	3
BIOL 3074 Human Physiology	4
ELEG 3133 Microprocessor Systems Design	3
ELEG 4192 Electrical Design Project II	2
ELEG 4303 Control Systems	3
Total Hours	**15**

[1]See appropriate alternatives or substitutions in "General Education Requirements".

[2]This program partners the BSEE Biomedical option undergraduate degree with the MSEE degree. A maximum of 12 graduate level credit hours can be counted towards both the BSEE Biomedical option 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 can replace ELEG 4313 Modern Control Systems
- ELEG 5113 can replace ELEG 4113 Digital Signal Processing
- ELEG 5153 can replace ELEG 4153 Communication Systems II
- ELEG 5133 can replace ELEG 4133 Advanced Digital Design
- ELEG 5993 can replace ELEG 4993 Special Problems in Engineering

The following courses are not required for the Biomedical Option major; however, they are recommended for application to an advanced medical degree program:

Semester	Course Number	Course Name	Credits
Sophomore Fall	BIOL 3034 Genetics	Genetics*	4
Sophomore Spring	CHEM 3264 Mechanistic Organic Chemistry	Mechanistic Organic Chemistry*	4
Junior Fall	CHEM 3344 Principles of Biochemistry	Principles of Biochemistry*	4
Senior Spring	BIOL 4033 Cell Biology	Cell Biology*	3
Total			**15**