

# DEPARTMENT OF ELECTRICAL ENGINEERING

## BACHELOR OF SCIENCE IN COMPUTER ENGINEERING

The computer engineering degree provides the educational background for engineers to pursue a career in the integrated hardware and software design development cycle for a variety of industries. Computer engineering is an academic discipline that blends electrical and electronic engineering with computer science.

Computer engineers build systems with embedded programmable devices such as microprocessor as well as general purpose programmable logic components (such as FPGA – field programmable gate arrays). Systems requiring computer control include a wide variety from medical (for example CAT – Computer Aided Tomography systems) to automotive (adaptive cruise control as well as completely autonomous vehicles). Computer engineers require competency in both hardware as well as software to facilitate designing, programming, and construction of these computer-based systems. The computer engineering curriculum at Arkansas Tech provides a solid background in a full spectrum of the knowledge and skills required to become a highly successful computer engineer. The Bachelor of Science in Computer 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 starting fall 2017 purchase laptop computers. 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 Computer 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 Computer Engineering

Major: Computer Engineering

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

### Freshman

Fall	Credits
ENGL 1013 Composition I <sup>1</sup>	3
FAH 1XXX Fine Arts and Humanities Courses <sup>1</sup>	3
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
<b>Total Hours</b>	<b>16</b>

Spring	Credits
ENGL 1023 Composition II <sup>1</sup>	3
COMS 1011 Programming Foundations I Lab and COMS 1013 Programming Foundations I	4
MATH 2924 Calculus II	4
ELEG 2130 Digital Logic Design Lab and ELEG 2134 Digital Logic Design	4

Spring	Credits
<b>Total Hours</b>	<b>15</b>

**Sophomore**

Fall	Credits
PHYS 2114 Calculus-Based Physics I and PHYS 2000 Physics Laboratory I	4
COMS 2203 Programming Foundations II	3
MATH 3243 Differential Equations I	3
ELEG 2103 Electric Circuits I	3
ELEG 3133 Microprocessor Systems Design	3
<b>Total Hours</b>	<b>16</b>

Spring	Credits
PHYS 2124 Calculus-Based Physics II and PHYS 2010 Physics Laboratory II	4
MATH 2934 Calculus III	4
STAT 3153 Applied Statistics	3
ELEG 2111 Electric Circuits Laboratory	1
ELEG 2113 Electric Circuits II	3
<b>Total Hours</b>	<b>15</b>

**Junior**

Fall	Credits
SS 1XXX Social Science Courses <sup>1</sup>	3
FAH 1XXX Fine Arts and Humanities Courses <sup>1</sup>	3
MATH 2703 Discrete Mathematics	3
ELEG 3003 System Modeling and Analysis / MCEG 3003 System Modeling and Analysis	3
ELEG 3103 Electronics I	3
<b>Total Hours</b>	<b>15</b>

Spring	Credits
COMS 2213 Data Structures	3
COMS 2223 Computer Organization and Programming	3
ELEG 3123 Signals and Systems	3
ELEG 3143 Electromagnetics	3
ELEG 4103 Electronics II	3

Spring	Credits
ELEG 4202 Engineering Design / MCEG 4202 Engineering Design	2
<b>Total Hours</b>	<b>17</b>

**Senior**

Fall	Credits
ELEG 4113 Digital Signal Processing <sup>3</sup>	3
ELEG 4133 Advanced Digital Design <sup>3</sup>	3
ELEG 4143 Communication Systems I	3
ELEG 4191 Electrical Design Project I	1
ELEG 4303 Control Systems	3
<b>Total Hours</b>	<b>13</b>

Spring	Credits
USHG 1XXX U.S. History and Government <sup>1</sup>	3
COMS 3703 Advanced Operating Systems	3
ELEG 4122 Electrical Systems Lab	2
ELEG 4192 Electrical Design Project II	2
Electrical Engineering Elective <sup>2, 3</sup>	3
<b>Total Hours</b>	<b>13</b>

<sup>1</sup>See appropriate alternatives or substitutions in "[General Education Requirements](#)".

<sup>2</sup>Engineering Elective must be a 3000 or 4000 level Electrical Engineering course.

<sup>3</sup>This program partners the BSCMPE undergraduate degree with the MSEE degree. A maximum of 12 graduate level credit hours can be counted towards both the BSCMPE degree in Computer 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