

# COMPUTER ENGINEERING, BACHELOR OF SCIENCE

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> (<https://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 (<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 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.

Course	Title	Hours
<b>Freshman</b>		
<b>Fall</b>		
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 & CHEM 2120	General Chemistry I and General Chemistry I Lab	4
ELEG 1011	Introduction to Electrical Engineering	1
TECH 1001	Orientation to the University	1
<b>Hours</b>		<b>16</b>

<b>Spring</b>		
ENGL 1023	Composition II <sup>1</sup>	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
<b>Hours</b>		<b>15</b>
<b>Sophomore</b>		
<b>Fall</b>		
PHYS 2114 & PHYS 2000	Calculus-Based Physics I and 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>Hours</b>		<b>16</b>
<b>Spring</b>		
PHYS 2124 & PHYS 2010	Calculus-Based Physics II and 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>Hours</b>		<b>15</b>
<b>Junior</b>		
<b>Fall</b>		
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/MCEG 3003	System Modeling and Analysis	3
ELEG 3103	Electronics I	3
<b>Hours</b>		<b>15</b>
<b>Spring</b>		
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
ELEG/MCEG 4202	Engineering Design	2
<b>Hours</b>		<b>17</b>
<b>Senior</b>		
<b>Fall</b>		
ELEG 4113	Digital Signal Processing <sup>2</sup>	3
ELEG 4133	Advanced Digital Design <sup>2</sup>	3
ELEG 4143	Communication Systems I	3
ELEG 4191	Electrical Design Project I	1
ELEG 4303	Control Systems	3
<b>Hours</b>		<b>13</b>
<b>Spring</b>		
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>Hours</b>		<b>13</b>
<b>Total Hours</b>		<b>120</b>

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

2 Computer Engineering, Bachelor of Science

- <sup>2</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 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
- <sup>3</sup> Engineering Elective must be a 3000 or 4000 level Electrical Engineering course.