

COMPUTER ENGINEERING (B.S.C.P.E.)

Computer engineering is at the intersection of electrical engineering and computer science, blending aspects of both to design computing solutions for today's challenges. Computer Engineering students will study both hardware and software design. In their hardware design courses, students study digital logic design, electronics, computer organization, embedded computer systems, and digital signal processing. In their software design courses, students study programming, data structures, algorithms, and complexity. In the integration of both hardware and software design, students gain a foundation in the key areas of computer engineering and are prepared for careers in a broad spectrum of industries. Elective courses allow a student to study a specialized field of interest, including areas like communication and networking, security, signal and image processing, control and robotics, digital and embedded systems, and quantum computing.

Computer Engineering Mission Statement

The mission of the Computer Engineering program is to educate students within a caring Christian environment, in the discipline of computer engineering. We want our graduates to be motivated by Christian ideals and to view their career as a lifelong commitment to serving others. We strive to provide our students with a strong technical foundation with an emphasis on professional, moral, ethical and leadership development.

BSCPE Program Educational Objectives

Within a few years after graduation, Baylor BSCPE graduates will:

- Be productive and valuable engineers.
- Be successful in high-quality MS, PhD, JD, MBA, and MD programs.
- Be mindful of the moral and ethical relationships that their engineering decisions have with society and the world.
- Make positive contributions to their communities, churches, and society at large.

BSCPE Expected Graduate Outcomes

In support of the program objectives, graduates of the program must demonstrate that they have:

1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. an ability to 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. an ability to communicate effectively with a range of audiences
4. an ability to 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. an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives

6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies

B.S.C.P.E. Degree Requirements

Code	Title	Hours
Degree Requirements		
Minimum 124 hours including the following:		
<i>General Education Requirements</i>		
ENG 1310	Research Writing: Writing and Academic Inquiry Seminars	3
GTX 2301	Intellectual Traditions of the Ancient World : Literature and Thought	3
or GTX 2302	Medieval Intellectual Traditions: Literature and Thought in Context	
PWR 3300	Technical Writing	3
REL 1310	The Christian Scriptures	3
REL 1350	The Christian Heritage	3
Foreign Language and Culture (https://catalog.baylor.edu/undergraduate/college-arts-sciences/#flc) Select 3 hours from the Foreign Language and Culture Distribution List for ECS Majors. Second-level proficiency must be reached if a foreign language is chosen.		3
Chapel: Two Semesters		0
Lifetime Fitness: Any LF 11XX course		1
PSC 1387	The U.S. Constitution, Its Interpretation, and the American Political Experience	3
or ENG 2301	British Literature	
<i>Mathematics and Basic Sciences</i>		
CHE 1301	Basic Principles of Modern Chemistry I	3
CSI 2350	Discrete Structures	3
MTH 1321	Calculus I	3
MTH 1322	Calculus II	3
MTH 2311	Linear Algebra	3
MTH 2321	Calculus III	3
MTH 3325	Ordinary Differential Equations	3
PHY 1420	General Physics I	4
PHY 1430	General Physics II	4
STA 3381	Probability and Statistics	3
General Education Total		54

Code	Title	Hours
<i>Computer Engineering Major</i>		
EGR 1301	Introduction to Engineering	3
EGR 1101	Engineering New Student Experience	1
EGR 1302	Introduction to Engineering Analysis	3
CSI 1430	Introduction to Computer Science I with Laboratory	4
CSI 1440	Introduction to Computer Science II with Laboratory	4
CSI 3334	Data Structures	3
CSI 3344	Introduction to Algorithms	3
EGR 2108	Engineering Economics	1

ELC 2337	Digital Logic Design	3
ELC 2137	Digital Logic Design Laboratory	1
ELC 2330	Electrical Circuit Theory	3
ELC 2130	Electrical Circuit Laboratory	1
EGR 3305	Social and Ethical Issues in Engineering	3
or EGR 3315	Ethics of International Service	
ELC 3335	Signals and Systems	3
ELC 3336	Microprocessor Systems	3
ELC 3338	Computer Organization	3
EGR 3380	Engineering Design I	3
ELC 4311	Advanced Logic Design	3
ELC 4351	Digital Signal Processing	3
ELC 4363	Networks and Security	3
ELC 4438	Embedded Systems Design	4
EGR 4390	Engineering Design II	3
Select two courses from the following:		6
EGR 3V95	Internship Experience	
ELC 4312		
ELC 4313	Advanced Computer Architecture	
ELC 4320	Introduction to Optics	
ELC 4315	VLSI	
ELC 4323	Solid-State Materials	
ELC 4324	Semiconductor Devices	
ELC 4330	Introduction to Robotics	
ELC 4350	Principles of Communication	
ELC 4353	Image Formation and Processing	
ELC 4366	Quantum Mechanics for Engineers	
ELC 4367	Introduction to Quantum Computing	
ELC 4372	Bioinstrumentation	
ELC 4396	Special Topics in Electrical or Computer Engineering (with approval)	
ELC 4V97	Special Projects in Electrical or Computer Engineering (with approval)	
CSI 3000 and 4000 courses (with approval)		
A grade of "C" or better in all of the Computer Engineering hours counted towards major		
Major Total		67

NOTE: Add additional elective hours as needed to reach 124 for degree.