



BS in COMPUTER ENGINEERING (393540) MAP Sheet
 Department of Electrical and Computer Engineering
 For students entering the degree program during the 2014–2015 curricular year.

UNIVERSITY CORE AND GRADUATION REQUIREMENTS				PROGRAM REQUIREMENTS (92–93 total hours)			
UNIVERSITY CORE REQUIREMENTS				Complete the following prerequisite courses:			
<u>Requirements</u>	<u>#Classes</u>	<u>Hours</u>	<u>Classes</u>	Math 112*	Calculus 1	4.0	Complete at least 16 hours from the following advanced technical program and technical electives: a. Complete at least two of the following courses:
				Math 113*	Calculus 2	4.0	
				Phscs 121*	Principles of Physics 1	3.0	
				Phscs 220	Principles of Physics 3	3.0	
Doctrinal Foundation				Complete the following supporting courses:			
Book of Mormon	2	4.0	RelA 121/H and 122/H	Chem 105*	General College Chemistry	4.0	b. Complete remaining course hours selected from the following: 1. Additional courses listed in item a above or other 400-level electrical and computer engineering courses, not including 490 or 493R.
New Testament	1	2.0	RelA 211/H or 212/H	Or			
Doctrine and Covenants	1	2.0	RelC 324/H or 325/H	Chem 111*	Principles of Chemistry	3.0	
The Individual and Society				C S 142	Introduction to Computer Programming	3.0	2. Any of the following:
Citizenship				C S 235	Data Structures and Algorithms	3.0	
American Heritage	1–2	3–6.0	from approved list	C S 236	Discrete Structures	3.0	
Global & Cultural Awareness	1	3.0	Eng T 231*	C S 240	Advanced Programming Concepts	4.0	
Skills				Engl 312*	Persuasive Writing	3.0	C S 340 Software Design & Testing 3.0 C S 345 Operating Systems Design 3.0 C S 360 Internet Programming 3.0 C S 428 Software Engineering 3.0 C S 431 Algorithmic Languages and Compilers 3.0 C S 452 Database Modeling Concepts 3.0 C S 455 Computer Graphics 3.0 C S 456 Introduction to User Interface Software 3.0 C S 460 Computer Comms & Networking 3.0 C S 462 Large-Scale Distributed System Design 3.0 C S 465 Computer Security 3.0 C S 470 Intro to Artificial Intelligence 3.0 C S 478 Tools for Machine Learning & Data M 3.0 CS 484 Parallel Processing 3.0 EC En 360 Electromagnetic Fields and Waves 4.0 Math 314 Calculus of Several Variables 3.0
Effective Communication				Or			
First-Year Writing	1	3.0	from approved list	Engl 316*	Technical Communication	3.0	
Adv Written & Oral Communication	1	3.0	Engl 312* or 316*	Eng T 231*	Foundations of Global Leadership	3.0	
Quantitative Reasoning	0–1	0–4.0	Math 112* or 113*	Math 313	Elementary Linear Algebra	3.0	
Languages of Learning (Math or Language)	1	4.0	Math 112* or 113*	Math 334	Ordinary Differential Equations	3.0	
Arts, Letters, and Sciences				Complete the following courses:			
Civilization 1 and 2	2	6.0	from approved list‡	EC En 191	New Student Seminar	0.5	3. 500-level EC En or computer science courses
Arts	1	3.0	from approved list‡	EC En 220	Fundamentals of Digital Systems	3.0	
Letters	1	3.0	from approved list‡	EC En 240	Circuit Analysis and Laboratory	4.0	4. Other courses as approved by the department.
Scientific Principles & Reasoning				EC En 320	Digital System Design	4.0	
Biological Science	1–2	3–5.0	from approved list	EC En 330	Intro to Embedded System Programming	4.0	
Physical Science	2	6–7.0	Chem 105* or 111* and Phscs 121*	EC En 340	Electronic Circuit Design 1	4.0	
Social Science	1	3.0	Eng T 231*	EC En 370	Probability Theory	3.0	
Core Enrichment: Electives				EC En 380	Signals and Systems	4.0	Note: Contact the Electrical and Computer Engineering Department for current information about added and/or deleted courses, as well as information about when courses are offered.
Religion Electives	3–4	6.0	from approved list	EC En 390	Junior Team Design Project	3.0	
Open Electives	Variable	Variable	personal choice	EC En 391	Junior Seminar	0.5	
				EC En 490	Team Design Project	4.0	
GRADUATION REQUIREMENTS:							
Minimum residence hours required		30.0					
Minimum hours needed to graduate		120.0					

FOR UNIVERSITY CORE QUESTIONS CONTACT THE ADVISEMENT CENTER ■ FOR PROGRAM QUESTIONS SEE YOUR DEPARTMENT ADVISOR

*THESE COURSES FILL BOTH UNIVERSITY CORE AND PROGRAM REQUIREMENTS (16–17 hours overlap)

‡REDUCTION OF TOTAL CREDITS IS RECOMMENDED by choosing a Civilization 2 course that also double counts for the Arts requirement (if a separate Letters course is taken) or the Letters requirement (if a separate Arts course is taken) — see the University Core list for specifics (core.byu.edu).

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Suggested Sequence of Courses*:

FRESHMAN YEAR

<u>1st Semester</u>	
EC En 191 (FW)	0.5
C S 142 (FWSpSu)	3.0
Chem 105 (FWSpSu)	4.0
1 st Year Writing or A Htg	3.0
Math 112 (FWSpSu)	4.0
Rel A 121 (FWSpSu)	2.0
Total Hours	16.5

2nd Semester

C S 235 (FWSp)	3.0
Math 113 (FWSpSu)	4.0
Phscs 121 (FWSp)	3.0
First-Year Writing or A Htg	3.0
Rel A 122 (FWSpSu)	2.0
Total Hours	15.0

SOPHOMORE YEAR

<u>3rd Semester</u>	
C S 236 (FWSpSu)	3.0
EC En 220 (FW)	3.0
Math 313 (FWSpSu)	3.0
Phscs 220 (FWSu)	3.0
Eng T 231	3.0
Rel A 211 or 212 (FWSpSu)	2.0
Total Hours	17.0

4th Semester

C S 240 (FWSu)	4.0
EC En 240 (FWSp)	4.0
Math 334 (FWSpSu)	3.0
University core requirement	3.0
Religion elective	2.0
Total Hours	16.0

JUNIOR YEAR

<u>5th Semester</u>	
EC En 330 (FSp)	4.0
EC En 340 (F)	4.0
EC En 391 (F)	0.5
EC En 380 (F)	4.0
Rel A 324 or 325	2.0
Total Hours	14.5

6th Semester

EC En 320 (W)	4.0
EC En 370 (WSp)	3.0
EC En 390 (W)	3.0
University core requirement	3.0
Religion elective	2.0
Total Hours	15.0

SENIOR YEAR

<u>7th Semester</u>	
Technical elective	4.0
Technical elective	4.0
University core requirement	3.0
University core requirement	3.0
Religion elective	2.0
Total Hours	16.0

8th Semester

EC En 490 (FW)	4.0
Technical elective	4.0
Technical elective	4.0
Engl 312 or 316	3.0
Total Hours	15.0

*Actual course sequences should be adapted to individual needs. For example, students with AP credits in Math, Physics, or Computer Science will already have credit for some initial courses. Many students find it beneficial to attend one or more spring or summer terms. On average, students take about nine semesters to graduate in this program.

THE DISCIPLINE:

Electrical and Computer Engineering is one of the most exciting, diverse, and forward-looking disciplines offered at the university. Contemporary society is in the midst of an information revolution, created in large part from the fruits of electrical and computer engineering. Electrical and computer engineers have been primary contributors to the astonishing developments in communication, computer, and network technology. They have designed devices and systems that have a significant impact on manufacturing, medicine, transportation, and environmental monitoring. Smart phones, tablets, digital cameras, high definition television, solar power, microprocessors, lasers, unmanned air vehicles, medical imaging systems, and autonomous robotic systems are all examples of devices and systems designed by electrical and computer engineers. Innovations that flow out of electrical and computer engineering sustain the national economy and improve the quality of life for people throughout the world. In the future, society will look to electrical and computer engineers to address grand challenges ranging from sustainable and efficient energy to health care technologies and global communications networks.

The Department of Electrical and Computer Engineering at Brigham Young University offers accredited degrees in Electrical Engineering and Computer Engineering. Electrical Engineering focuses on microelectronics, electromagnetics, electronic circuits, wireless communications, signal processing, biomedical applications, photonics, and controls. Computer Engineering focuses on the design of digital computing devices and systems and involves hardware and software, operating systems, digital logic, real-time systems, and computer vision. Both programs combine fundamental principles with hands-on learning, including an innovative Junior Core experience that integrates classroom knowledge with project-based learning.

CO-OP and INTERNSHIP EXPERIENCES:

Optional co-op and internship experiences with engineering firms throughout the USA are available. These experiences may extend over one semester plus the spring/summer terms, for a total of eight months.

PROFESSIONAL AND HONOR SOCIETIES:

The student chapter of the Institute of Electrical and Electronic Engineers is the professional organization; Eta Kappa Nu is the electrical and computer engineering honor society; and Tau Beta Pi is the honor society for all engineering fields.

CAREERS:

Electrical and computer engineers are among the most actively recruited students graduating from a four-year program. Baccalaureate engineers typically start their careers as members of project teams with one or more of the following responsibilities: designing digital, analog, or opto-electronic circuits; creating or testing application-specific software; testing components or systems; or providing technical support for sales. Later on, many engineers find themselves pursuing managerial careers, starting their own companies, or even managing entrepreneurial funds. Top graduates are also well received by medical schools, law schools, and professional and management programs.

The BS curriculum for both the electrical engineering and computer engineering degrees is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology, Inc. (ABET).

The student advisor in the department can assist you in choosing electives to meet your total hour requirement.

Note: Students are encouraged to complete an average of 16 credit hours each semester or 32 credit hours each year, which could include spring and/or summer terms. Taking fewer credits substantially increases the cost and the number of semesters to graduate.

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