



BS in COMPUTER ENGINEERING (393540) MAP Sheet
 Department of Electrical and Computer Engineering
 For students entering the degree program during the 2006–2007 curricular year.

This is a limited-enrollment program requiring departmental admissions approval. Please see the college advisement center or department office for information regarding requirements for admission to this major.

UNIVERSITY CORE AND GRADUATION REQUIREMENTS				MAJOR REQUIREMENTS (91.5–92.5 total hours)	
UNIVERSITY CORE REQUIREMENTS (48.5 hours minimum)				Complete the following preprofessional program as soon as possible upon entering BYU: a. Complete the following: Math 112* Calculus 1 4.0 Math 113* Calculus 2 4.0 Phscs 121* Principles of Physics 1 3.0 Phscs 220* Principles of Physics 3 3.0 b. During the semester of completing the above, obtain an application from the college advisement center and apply for professional status. (Contact the department or the college advisement center [264 CB] for additional details.) Complete the following supporting courses (either as a preprofessional or a professional student): C S 142 Introduction to Computer Programming C S 235 Data Structures and Algorithms C S 236 Discrete Structures C S 240 Advanced Programming Concepts EC En 124 Introduction to Computing Systems 3.0 EC En 224 Fundamentals of Digital Systems 3.0 Math 334 Ordinary Differential Equations 3.0 Math 343 Elementary Linear Algebra 3.0 And complete one course from the following: Chem 105* General College Chemistry 3.0 Chem 111* Principles of Chemistry 3.0 And complete one course from the following: Engl 312* Persuasive Writing 3.0 Engl 316* Technical Writing 4.0 Complete the following professional requirements: EC En 212 Circuit Analysis and Laboratory 3.0 EC En 313 Electronic Circuit Design 1 3.0 EC En 317 Electronics Laboratory 1 EC En 320 Digital System Design EC En 324 Computer System Architecture 5.0 EC En 370 Probability Theory 4.0 EC En 380 Signals and Systems 1.0 EC En 391 Junior Seminar 3.0 EC En 490 Team Design Project 3.0 5.0 0.5 4.0	
Requirements #Classes Hours Classes				Complete at least 19 hours from the following advanced program and technical electives: a. Complete at least two of the following courses: EC En 425 Real-Time Operating Systems 4.0 EC En 427 Embedded Systems 4.0 EC En 451 Introduction to Digital VLSI Circuits 4.0 b. Complete one of the following options: Either EC En 362 Transmission Line Fundamentals for High-Speed Digital Systems 2.0 Or EC En 360 Transmission Lines & Introductory Fields 4.0 EC En 361 Transmission Lines & Intro. Fields Lab 1.0 c. Complete remaining course hours from the following: 1. C S 345, 428, 431, 452, 455, 456, 460, 462, 465, 470, 478, 486 2. 500-level computer science courses 3. 300-level and higher electrical and computer engineering courses (except 301) <u>not used to satisfy requirement a above.</u>	
Doctrinal Foundation Book of Mormon 2 4.0 RelA 121/H and 122/H New Testament 1 2.0 RelA 211/H or 212/H Doctrine and Covenants 1 2.0 RelC 324/H or 325/H				Suggested Courses are: C S 345 Operating Systems Design 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 Communications & Networking 3.0 C S 462 Large-Scale Distributed System Design 3.0 C S 465 Computer Security 3.0 C S 470 Introduction to Artificial Intelligence 3.0 C S 478 Intro. to Neural Networks & Machine Learn. 3.0 C S 486 Verification and Validation 3.0 EC En 443 Communication and Power Circuits 3.0 EC En 445 Introduction to Mixed Signal VLSI 4.0 EC En 450 Introduction to Semiconductor Devices 4.0 (Continued on back side) 3.0	
The Individual and Society Wellness 1or3 1.5–2.0 from approved list Citizenship American Heritage 1–2 3–6.0 from approved list Global & Cultural Awareness 1 3.0 from approved list†				GRADUATION REQUIREMENTS: Minimum residence hours required 30.0 Minimum hours needed to graduate 120.0	
Skills Effective Communication First-Year Writing 1 3.0 from approved list Adv Written & Oral Communication 1 3.0 Engl 312* or 316* Quantitative Reasoning 1 4.0 Math 112* or 113* Languages of Learning (Math or Language) 1 4.0 Math 112* or 113*					
Arts, Letters, and Sciences Civilization 1 and 2 2 6.0 from approved list‡ Arts 1 3.0 from approved list‡ Letters 1 3.0 from approved list‡ Scientific Principles & Reasoning Biological Science 1–2 3–6.0 from approved list Physical Science 2 6–7.0 Chem 105* or 111* and Phscs 121* or 220* from approved list Social Science 1 3.0					
Core Enrichment: Electives Religion Electives 3–4 6.0 from approved list† Open Electives Variable Variable personal choice					

FOR UNIVERSITY CORE QUESTIONS CONTACT THE ADVISEMENT CENTER ■ FOR MAJOR QUESTIONS SEE YOUR DEPARTMENT ADVISOR
 *THESE COURSES FILL BOTH UNIVERSITY CORE AND MAJOR REQUIREMENTS (13–14.0 hours overlap)

†REDUCTION OF TOTAL CREDITS IS RECOMMENDED by satisfying the Global & Cultural Awareness requirement using either 1) Rel C 351 or a combination of Rel C 355 and 356 (which also double counts to satisfy part of the religion elective requirements) or 2) a combination of a foreign-language mission with the 300- or 400-level foreign language culminating course (which many students take anyway).

‡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.

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EC En 450	Introduction to Semiconductor Devices	
EC En 452	Experiments in Integrated Circuit Develop.	1.0
EC En 455	VLSI Testing	1.0
EC En 462	Electromagnetic Radiation & Propagation	2.0
EC En 464	Wireless Communication Circuits	2.0
EC En 466	Introduction to Optical Engineering	2.0
EC En 483	Feedback Control of Systems	4.0
EC En 485	Intro to Digital Communication	4.0
EC En 487	Intro to Discrete Signal Processing	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.

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.

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.

Suggested Sequence of Courses*:

FRESHMAN YEAR

<u>1st Semester</u>	
C S 142 (FWSpSu)	3.0
Chem 105 (FWSpSu)	4.0
1 st Year Writing	3.0
Math 112 (FWSpSu)	4.0
Rel A 121 (FWSpSu)	2.0
Total Hours	16.0

2nd Semester

EC En 124 (FWSpSu)	3.0
Math 113 (FWSpSu)	4.0
Phscs 121 (FWSpSu)	3.0
American Heritage requirement	3.0
Wellness requirement	2.0
Rel A 122 (FWSpSu)	2.0
Total Hours	17.0

SOPHOMORE YEAR

<u>3rd Semester</u>	
C S 235 (FWSp)	3.0
EC En 224 (FWSu)	3.0
Math 343 (FWSpSu)	3.0
Phscs 220 (FWSp)	3.0
University core requirement	3.0
Rel A 211 or 212 (FWSpSu)	2.0
Total Hours	17.0

4th Semester

C S 240 (FWSu)	3.0
EC En 212 (FWSp)	5.0
EC En 324 (FWSp)	3.0
University core requirement	3.0
Religion elective	2.0
Total Hours	16.0

JUNIOR YEAR

<u>5th Semester</u>	
C S 236 (FWSu)	3.0
EC En 313 (FWSp)	4.0
EC En 317 (FWSp)	1.0
EC En 391 (F)	0.5
Engl 312 or 315	3.0
Math 334 (FWSpSu)	3.0
Rel A 324 or 325	2.0
Total Hours	16.5

6th Semester

EC En 320 (FW)	3.0
EC En 362 (FW)	2.0
EC En 380 (FWSp)	5.0
C S elective	3.0
University core requirement	3.0
Total Hours	16.0

SENIOR YEAR

<u>7th Semester</u>	
EC En 370 (FW)	3.0
Technical elective	4.0
Technical elective	4.0
University core requirement	3.0
Religion elective	2.0
Total Hours	16.0

8th Semester

EC En 490 (FW)	4.0
Technical elective	3.0
Technical elective	3.0
University core requirement	3.0
Religion elective	2.0
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 engineers study phenomena, devices, and systems for information processing, communication, and systems control. These studies, grounded primarily in physics and mathematics, have enabled engineers to develop the innovative new technologies for information acquisition, processing, storage, and communication that have made possible our contemporary Age of Information.

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Examples of systems developed by electrical and computer engineers include radio, television, radar, satellite communication systems, cellular telephones, laptop computers, fiber-optic communications devices, global and local computer networks, robotic systems, control systems, fax machines, medical image processing, computer modems, lasers, pagers, computer vision, programmable calculators, VLSI chips, computer-aided design tools, and medical instruments.

Although it is the goal of engineering to produce useful objects, electrical and computer engineers typically play a limited role in construction, assembly, or mass production. Instead, they focus on design, analysis, and the development of the underlying theory and knowledge applied in the design process.

CO-OP EXPERIENCES:

Optional co-op experiences with engineering firms throughout the USA are available. These experiences typically 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, 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).

Electrical and Computer Engineering Department
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