BS in COMPUTER ENGINEERING (393540) MAP Sheet

Department of Electrical and Computer Engineering

For students entering the degree program during the 2004–2005 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

UNIVERSITY CORE REQUIREMENTS
(48.5 hours minimum)

Requirements	#Classes	Hours	Classes
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
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†
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	0–1	0–3.0	from approved list
Languages of Learning (Math or Language)	1	4.0	Math 112*
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*, Phscs 121*
Social Science	1	3.0	from approved list
Core Enrichment: Electives			
Religion Electives	3–4	6.0	from approved list†
Open Electives	Variable	Variable	personal choice

GRADUATION REQUIREMENTS:

Minimum residence hours required	30.0
Minimum hours needed to graduate	120.0

MAJOR REQUIREMENTS (92.5–93.5 total hours)

Complete the following preprofessional program as soon as possible upon entering BYU:

a. Complete the following (or approved equivalent courses):

Math	112*	Calculus 1	4.0
Math	113	Calculus 2	4.0
Phscs	121*	Princ of Physics	3.0
Phscs	220	Princ of Physics	3.0

b. Complete at least one preprofessional course (other than Engl 312 or 316) from the list of supporting courses below.

c. 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 for additional details.)

Complete the following supporting courses (either as a preprofessional or a professional student):

CS	142	Intro Comp Prog	3.0
CS	235	Foundations of Comp Science 1	3.0
CS	236	Foundations of Comp Science 2	3.0
CS	240	Adv. Programming Concept	3.0
ECEn	124	Intro to Computing Systems	3.0
ECEn	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*	Gen College Chem	4.0
Chem	111*	Principles of Chemistry	3.0

And complete one course from the following:

Engl	312*	Persuasive Writing	3.0
Engl	316*	Technical Writing	3.0

Complete the following professional requirements:

ECEn	212	Circuits	5.0
ECEn	313	Electronic Circuit Design 1	4.0
ECEn	317	Electronics Lab 1	1.0
ECEn	320	Digital System Design	3.0
ECEn	324	Computer System Architecture	3.0
ECEn	370	Probability Theory	3.0
ECEn	380	Signal and Systems	5.0
ECEn	490	Team Design Project	4.0
ECEn	491	Senior Seminar	0.5

Complete at least 20 hours from the following advanced program and technical electives:

a. Complete at least two hours from the following courses:

ECEn	360	Transmission Lines and Intro Fields	4.0
ECEn	361	Transmission Lines & Intro Fields Lab	1.0
ECEn	362	Transmission Lines	2.0

Note: Students will not receive credit for both ECEn 360/361 and ECEn 362.

b. Complete at least two of the following courses:

ECEn	425	Real-Time Operating Systems	4.0
ECEn	427	Embedded Systems	4.0
ECEn	451	Intro to Digital VLSI Circuits	4.0

c. Complete remaining course hours from the following:

(1) Additional courses listed in a and b above.
(2) CS 345, 428, 431, 452, 455, 456, 460, 462, 465, 470, 478.
(3) 500-level computer science courses.
(4) 300-level and higher electrical and computer engineering courses except 301.
(5) Other engineering, mathematics, and physics courses as specified or approved by the Electrical and Computer Engineering Department.

Suggested courses are:

ChEn	381	Integrated Circuit Processing	3.0
CS	345	Operating System Design	3.0
CS	428	Software Systems Design	3.0
CS	431	Algorithmic Lang & Compilers	3.0
CS	452	Database Modeling Concepts	3.0
CS	455	Computer Graphics	3.0
CS	456	Intro User Interface Software	3.0
CS	460	Computer Comm & Networking	3.0
CS	462	Large Scale Distributed Sys Design	3.0
CS	465	Computer Security	3.0
CS	470	Intro to Artificial Intelligence	3.0
CS	478	Intro to Neural Networks & Machine Lrn	3.0
CS	486	Verification and Validation	4.0
ECEn	443	Electronic Circuit Design 2	3.0
ECEn	445	Intro to Mixed Signal VLSI	4.0
ECEn	450	Intro to Semiconductor Devices	3.0
ECEn	452	Experiments in IC development	1.0
ECEn	455	VLSI Testing	1.0

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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) RelC 351 or a combination of RelC 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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ECEn	460	Applied Electromagnetic Theory	3.0
ECEn	461	Electromagnetics Laboratory	1.0
ECEn	483	Feedback Control of Systems	4.0
ECEn	485	Intro to Digital Communication	4.0
ECEn	487	Intro to Discrete Signal Processing	4.0
Math	214	Calculus of Several Variables	3.0
Math	332	Intro to Complex Analysis	3.0
Math	347	Intro to Partial Differnetial Eqns	3.0
Math	411	Numerical methods	3.0
Phscs	222	Modern Physics	3.0
Phscs	281	Principles of Solid State Physics	3.0

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.

Suggested Sequence of Courses*:

FRESHMAN YEAR

1st Semester

CS 142 (FWSpSu)	3.0
1st Year Writing	3.0
HEPE 129 (FWSpSu)	2.0
Math 112 (FWSpSu)	4.0
RelA 121 (FWSpSu)	2.0
Total Hours	**14.0**

2nd Semester

AHtg 100 (FWSpSu)	3.0
ECEn 124 (FWSpSu)	3.0
Math 113 (FWSpSu)	4.0
Phscs 121 (FWSpSu)	3.0
RelA 122 (FWSpSu)	2.0
Total Hours	**15.0**

Spring Term

Phscs 220 (FWSp)	3.0
Math 343 3.0	
Total Hours	**6.0**

SOPHOMORE YEAR

3rd Semester

CS 235 (FWSp)	3.0
ECEn 212 (FWSp)	5.0
Math 334 (FWSpSu)	3.0
RelA 211 or 212 (FWSpSu)	2.0
Total Hours	**13.0**

4th Semester

CS 236 (FWSu)	3.0
ECEn 224 (FWSu)	3.0
ECEn 313 (FWSp)	4.0
ECEn 317 (FWSp)	1.0
ECEn 362 (FW)	2.0
Religion elective	2.0
Total Hours	**15.0**

Spring Term

Chem 105 (FWSpSu)	4.0
Arts & Letters elective	3.0
Total Hours	**7.0**

JUNIOR YEAR

5th Semester

Civilization 1	3.0
CS 240 (FWSu)	3.0
ECEn 380 (FWSp)	5.0
ECEn 320 (FW)	3.0
Total Hours	**14.0**

6th Semester

Civilization 2	3.0
RelC 324 or 325	2.0
ECEn 370 (FW)	3.0
ECEn 324 (FWSp)	3.0
ECEn 4xx - adv. Core elective	4.0
Total Hours	**15.0**

SENIOR YEAR

7th Semester

Engl 312 or 316	3.0
Biological Science	3.0
ECEn 491 (FW)	0.5
ECEn 4xx - adv. Core elective	4.0
Religion elective	2.0
Technical elective	3.0
Total Hours	**15.5**

8th Semester

ECEn 490 (FW)	4.0
Technical elective	4.0
Religion elective	2.0
Social and Behavioral Science elective	3.0
Technical elective	3.0
Total Hours	**16.0**

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.

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).

*For other options please go to the department web site: www.ee.byu.edu and review the undergraduate information.

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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