



**BS in ELECTRICAL ENGINEERING (393550) MAP Sheet**  
 Department of Electrical and Computer Engineering  
 For students entering the degree program during the 2015–2016 curricular year.

UNIVERSITY CORE AND GRADUATION REQUIREMENTS				PROGRAM REQUIREMENTS (92-93 total hours)			
UNIVERSITY CORE REQUIREMENTS				<b>Complete the following prerequisite courses:</b> 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>Complete the following supporting courses:</b> Chem 105* General College Chemistry 4.0 <b>Or</b> Chem 111* Principles of Chemistry 3.0  C S 142 Introduction to Computer Programming 3.0 C S 235 Data Structures and Algorithms 3.0  Engl 312* Persuasive Writing 3.0 <b>Or</b> Engl 316* Technical Communication 3.0  Eng T 231* Foundations of Global Leadership 3.0  Math 313 Elementary Linear Algebra 3.0 Math 314 Calculus of Several Variables 3.0 Math 334 Ordinary Differential Equations 3.0  <b>Complete the following:</b> EC En 191 New Student Seminar 0.5 EC En 220 Fundamentals of Digital Systems 3.0 EC En 240 Circuit Analysis and Laboratory 4.0 EC En 330 Intro to Embedded System Programming 4.0 EC En 340 Electronic Circuit Design 1 4.0 EC En 360 Electromagnetic Fields & Waves 4.0 EC En 370 Probability Theory 3.0 EC En 380 Signals and Systems 4.0 EC En 390 Junior Team Design Project 3.0 EC En 391 Junior Seminar 0.5 EC En 490 Team Design Project 4.0			
<b>Requirements</b> <b>#Classes</b> <b>Hours</b> <b>Classes</b>  <b>Religion Cornerstones</b> Teachings and Doctrine, Book of Mormon 1 2.0 Rel A 275 Jesus Christ & the Everlasting Gospel 1 2.0 Rel A 250 Foundations of the Restoration 1 2.0 Rel C 225 The Eternal Family 1 2.0 Rel C 200  <b>The Individual and Society</b> Citizenship American Heritage 1–2 3–6.0 from approved list Global & Cultural Awareness 1 3.0 Eng T 231*  <b>Skills</b> 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 0–4.0 Math 112* or 113* Languages of Learning (Math or Language) 1 4.0 Math 112* or 113*  <b>Arts, Letters, and Sciences</b> 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 3–5.0 from approved list Physical Science 2 6–7.0 Chem 105* or 111* and Phscs 121* Social Science 1 3.0 Eng T 231*  <b>Core Enrichment: Electives</b> Religion Electives 3–4 6.0 from approved list Open Electives Variable Variable personal choice				<b>Complete at least 20 hours from the following advanced technical program and technical electives:</b> <b>a. Complete 16 hours from the following:</b> EC En 320 Digital System Design 4.0 EC En 443 Communication and Power Circuits 4.0 EC En 445 Introduction to Mixed-Signal VLSI 3.0 EC En 450 Introduction to Semiconductor Devices 4.0 EC En 452 Experiments in Integrated Circuit Dev 2.0 EC En 462 Electromagnetic Radiation & Prop 2.0 EC En 464 Wireless Communication Circuits 2.0 EC En 466 Introduction to Optical Engineering 4.0 EC En 483 Design of Control Systems 4.0 EC En 485 Intro to Digital Communication Theory 4.0 EC En 487 Intro to Discrete-Time Signal Processing  <b>b. Complete remaining course hours selected from the following:</b> <b>1.</b> Additional courses listed in item a above. <b>2.</b> CS 236, 240, 340, 345, 360, 428, 431, 452, 455, 456, 460, 462, 465, 470, 478 EC En 424, 425, 427, 451 Math 341, 342, 352, 355, 371, 372, 411, 447, 450, 487 Phscs 222 <b>3.</b> 500-level electrical and computer engineering courses. <b>4.</b> Other engineering, mathematics, physics, or computer science courses as specified or approved by the Electrical and Computer Engineering Department.  <b>Note:</b> 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.			
GRADUATION REQUIREMENTS:							
Minimum residence hours required 30.0							
Minimum hours needed to graduate 120.0							

FOR GE QUESTIONS CONTACT THE ADVISEMENT CENTER ◆ FOR PROGRAM QUESTIONS SEE YOUR DEPARTMENT ADVISOR  
 \*THESE CLASSES 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.

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## 2015–2016

### 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 <sup>st</sup> Year Writing or A Htg	3.0
Math 112 (FWSpSu)	4.0
Religion Cornerstone course	2.0
<b>Total Hours</b>	<b>16.5</b>

#### 2nd Semester

C S 235 (FWSpSu)	3.0
Math 113 (FWSpSu)	4.0
Phscs 121 (FWSp)	3.0
First-Year Writing or A Htg	3.0
Religion Cornerstone course	2.0
<b>Total Hours</b>	<b>15.0</b>

#### SOPHOMORE YEAR

<u>3rd Semester</u>	
EC En 220 (FW)	3.0
Math 313 (FWSpSu)	3.0
Phscs 220 (FWSu)	3.0
Eng T 231	3.0
University core requirement	3.0
Religion Cornerstone course	2.0
<b>Total Hours</b>	<b>17.0</b>

#### 4th Semester

EC En 240 (FWSp)	4.0
Math 314 (FWSpSu)	3.0
Math 334 (FWSpSu)	3.0
University core requirement	3.0
Religion elective	2.0
<b>Total Hours</b>	<b>15.0</b>

#### JUNIOR YEAR

<u>5th Semester</u>	
EC En 330 (FSp)	4.0
EC En 340	4.0
EC En 380 (F)	4.0
EC En 391 (F)	0.5
Religion Cornerstone course	2.0
<b>Total Hours</b>	<b>14.5</b>

#### 6th Semester

EC En 360 (W)	4.0
EC En 370 (WSp)	3.0
EC En 390 (W)	3.0
University core requirement	3.0
Religion elective	2.0
<b>Total Hours</b>	<b>15.0</b>

#### SENIOR YEAR

<u>7th Semester</u>	
Technical elective	4.0
Technical elective	4.0
Technical elective	4.0
University core requirement	3.0
Religion elective	2.0
<b>Total Hours</b>	<b>17.0</b>

#### 8th Semester

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

\*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 Electrical Engineering baccalaureate program is accredited by the Engineering Accreditation Commission of ABET, Inc., <http://www.abet.org>.

**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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