



**BS in ELECTRICAL ENGINEERING (393550) MAP Sheet**  
 Department of Electrical and Computer Engineering  
 For students entering the degree program during the 2001–2002 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.

GENERAL EDUCATION AND UNIVERSITY REQUIREMENTS (52.5–57.0 hours)				MAJOR REQUIREMENTS (92.5–93.5 total hours)																																																																																																																																																																																		
GENERAL EDUCATION REQUIREMENTS (38.5–43.0 hours)				<p><b>Complete the following preprofessional program as soon as possible upon entering BYU:</b></p> <p><b>a. Complete the following (or approved equivalent courses):</b></p> <table border="0"> <tr><td>ECEn 191</td><td>Freshman Seminar</td><td>0.5</td></tr> <tr><td>Math 112*</td><td>Calculus 1</td><td>4.0</td></tr> <tr><td>Math 113</td><td>Calculus 2</td><td>4.0</td></tr> <tr><td>Phscs 121*</td><td>Principles of Physics 1</td><td>3.0</td></tr> <tr><td>Phscs 220*</td><td>Principles of Physics 3.</td><td>3.0</td></tr> </table> <p><b>Note:</b> Although ECEn 191 is not required before application for professional status, take it as early as possible.</p> <p><b>b. Complete at least one course (other than Engl 312 or 316) from those listed below.</b></p> <p><b>c. During the semester of completing the above, obtain an application</b> from the college advisement center and apply for professional status. (Contact the department office or the college advisement center for additional details.)</p> <p><b>Complete the following supporting courses (either as a preprofessional or a professional student):</b></p> <table border="0"> <tr><td>CS 142</td><td>Intro Comp Prog</td><td>3.0</td></tr> <tr><td>CS 235</td><td>Foundations of Computer Science 1</td><td>4.0</td></tr> <tr><td>ECEn 124</td><td>Intro to Computing Systems</td><td>2.0</td></tr> <tr><td>Math 214</td><td>Calculus of Several Variables</td><td>3.0</td></tr> <tr><td>Math 334</td><td>Ordinary Differential Equations</td><td>3.0</td></tr> <tr><td>Math 343</td><td>Elementary Linear Algebra</td><td>3.0</td></tr> <tr><td>Phscs 281</td><td>Prin of Solid State Physics</td><td>3.0</td></tr> <tr><td>Stat 421</td><td>Prob &amp; Distribution Theory</td><td>3.0</td></tr> </table> <p><b>And complete one course from the following:</b></p> <table border="0"> <tr><td>Chem 105*</td><td>Gen College Chem</td><td>4.0</td></tr> <tr><td>Chem 111*</td><td>Principles of Chemistry</td><td>3.0</td></tr> </table> <p><b>And complete one course from the following:</b></p> <table border="0"> <tr><td>Engl 312*</td><td>Persuasive Writing</td><td>3.0</td></tr> <tr><td>Engl 316*</td><td>Technical Writing</td><td>3.0</td></tr> </table> <p><b>Complete the following professional requirements:</b></p> <table border="0"> <tr><td>ECEn 212</td><td>Circuit Analysis and Laboratory</td><td>5.0</td></tr> <tr><td>ECEn 224</td><td>Fundamentals of Digital Systems</td><td>3.0</td></tr> <tr><td>ECEn 313</td><td>Electron Circuit Design 1</td><td>4.0</td></tr> <tr><td>ECEn 317</td><td>Electronics Lab 1</td><td>1.0</td></tr> <tr><td>ECEn 360</td><td>Transmission Lines and Fields</td><td>4.0</td></tr> <tr><td>ECEn 361</td><td>Trans Lines &amp; Fields Lab</td><td>1.0</td></tr> <tr><td>ECEn 380</td><td>Signals &amp; Systems</td><td>5.0</td></tr> <tr><td>ECEn 490</td><td>Team Design Project</td><td>4.0</td></tr> </table>				ECEn 191	Freshman Seminar	0.5	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	CS 142	Intro Comp Prog	3.0	CS 235	Foundations of Computer Science 1	4.0	ECEn 124	Intro to Computing Systems	2.0	Math 214	Calculus of Several Variables	3.0	Math 334	Ordinary Differential Equations	3.0	Math 343	Elementary Linear Algebra	3.0	Phscs 281	Prin of Solid State Physics	3.0	Stat 421	Prob & Distribution Theory	3.0	Chem 105*	Gen College Chem	4.0	Chem 111*	Principles of Chemistry	3.0	Engl 312*	Persuasive Writing	3.0	Engl 316*	Technical Writing	3.0	ECEn 212	Circuit Analysis and Laboratory	5.0	ECEn 224	Fundamentals of Digital Systems	3.0	ECEn 313	Electron Circuit Design 1	4.0	ECEn 317	Electronics Lab 1	1.0	ECEn 360	Transmission Lines and Fields	4.0	ECEn 361	Trans Lines & Fields Lab	1.0	ECEn 380	Signals & Systems	5.0	ECEn 490	Team Design Project	4.0	<p><b>Complete at least 20 hours from the following advanced program and technical electives:</b></p> <p><b>a. Complete at least 4 courses selected from at least 3 of the following groups:</b></p> <p>Group 1 (Microelectronics):</p> <table border="0"> <tr><td>ECEn 443</td><td>Electron Ckt Des</td><td>4.0</td></tr> <tr><td>ECEn 445</td><td>Intro to Mixed Signal VLSI</td><td>4.0</td></tr> <tr><td>ECEn 450</td><td>Intro Semiconductor Devices</td><td>3.0</td></tr> <tr><td>ChEn 381</td><td>Intro to Semiconductor Processing</td><td>3.0</td></tr> </table> <p>Group 2 (Electromagnetics):</p> <table border="0"> <tr><td>ECEn 460</td><td>Applied Electromagnetic Theory</td><td>3.0</td></tr> </table> <p>Group 3 (Signals and Systems):</p> <table border="0"> <tr><td>ECEn 483</td><td>Feedback Control of Dyn Systems</td><td>4.0</td></tr> <tr><td>ECEn 485</td><td>Intro to Digital Comm Theory</td><td>4.0</td></tr> <tr><td>ECEn 487</td><td>Intro to Discrete-Time Signl Proc</td><td>4.0</td></tr> </table> <p>Group 4 (Computers):</p> <table border="0"> <tr><td>ECEn 324</td><td>Computer Architecture</td><td>4.0</td></tr> <tr><td>ECEn 425</td><td>Real-Time EMB Systems</td><td>4.0</td></tr> <tr><td>ECEn 427</td><td>Computer Input/Output Devices</td><td>4.0</td></tr> <tr><td>ECEn 451</td><td>Intro Dig VLSI Circuits</td><td>4.0</td></tr> </table> <p><b>b. Complete remaining course hours selected from the following:</b></p> <p>(1) additional courses listed in a above, or other 400-level ECEn courses.</p> <p>(2) 500-level ECEn courses.</p> <p>(3) Other engineering, mathematics, physics, or computer science courses as specified or approved by the ECEn department. Some suggested courses are:</p> <table border="0"> <tr><td>CS 236</td><td>Foundations of Computer Science 2</td><td>4.0</td></tr> <tr><td>CS 240</td><td>Advanced Programming</td><td>3.0</td></tr> <tr><td>ECEn 452</td><td>Experiments in IC Development</td><td>1.0</td></tr> <tr><td>ECEn 455</td><td>VLSI Testing</td><td>1.0</td></tr> <tr><td>ECEn 461</td><td>Electromagnetics Laboratory</td><td>1.0</td></tr> <tr><td>Math 315</td><td>Theory of Analysis</td><td>3.0</td></tr> <tr><td>Math 316</td><td>Theory of Analysis</td><td>3.0</td></tr> <tr><td>Math 332</td><td>Intro to Complex Analysis</td><td>3.0</td></tr> <tr><td>Math 347</td><td>Intro to Partial Differential Eqns</td><td>3.0</td></tr> <tr><td>Math 350</td><td>Combinatorics</td><td>3.0</td></tr> <tr><td>Math 355</td><td>Graph Theory</td><td>3.0</td></tr> <tr><td>Math 371</td><td>Abstract Algebra</td><td>3.0</td></tr> <tr><td>Math 372</td><td>Abstract Algebra</td><td>3.0</td></tr> <tr><td>Math 387</td><td>Number Theory</td><td>3.0</td></tr> <tr><td>Math 411</td><td>Numerical Methods</td><td>3.0</td></tr> <tr><td>Math 480</td><td>Mathematical Models</td><td>3.0</td></tr> <tr><td>Math 500-level courses</td><td></td><td></td></tr> <tr><td>Phscs 222</td><td>Modern Physics</td><td>3.0</td></tr> <tr><td>Phscs 400-level courses</td><td></td><td></td></tr> <tr><td>Phscs 500-level courses</td><td></td><td></td></tr> </table> <p>Other courses as approved by the department</p>				ECEn 443	Electron Ckt Des	4.0	ECEn 445	Intro to Mixed Signal VLSI	4.0	ECEn 450	Intro Semiconductor Devices	3.0	ChEn 381	Intro to Semiconductor Processing	3.0	ECEn 460	Applied Electromagnetic Theory	3.0	ECEn 483	Feedback Control of Dyn Systems	4.0	ECEn 485	Intro to Digital Comm Theory	4.0	ECEn 487	Intro to Discrete-Time Signl Proc	4.0	ECEn 324	Computer Architecture	4.0	ECEn 425	Real-Time EMB Systems	4.0	ECEn 427	Computer Input/Output Devices	4.0	ECEn 451	Intro Dig VLSI Circuits	4.0	CS 236	Foundations of Computer Science 2	4.0	CS 240	Advanced Programming	3.0	ECEn 452	Experiments in IC Development	1.0	ECEn 455	VLSI Testing	1.0	ECEn 461	Electromagnetics Laboratory	1.0	Math 315	Theory of Analysis	3.0	Math 316	Theory of Analysis	3.0	Math 332	Intro to Complex Analysis	3.0	Math 347	Intro to Partial Differential Eqns	3.0	Math 350	Combinatorics	3.0	Math 355	Graph Theory	3.0	Math 371	Abstract Algebra	3.0	Math 372	Abstract Algebra	3.0	Math 387	Number Theory	3.0	Math 411	Numerical Methods	3.0	Math 480	Mathematical Models	3.0	Math 500-level courses			Phscs 222	Modern Physics	3.0	Phscs 400-level courses			Phscs 500-level courses		
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Book of Mormon	2	4.0	RelA 121 and 122																																																																																																																																																																																			
New Testament	1	2.0	RelA 211 or 212																																																																																																																																																																																			
Doctrine & Covenants	1	2.0	RelC 324 or 325																																																																																																																																																																																			
Elective courses	2–6	6.0																																																																																																																																																																																				
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Residence hours		30.0																																																																																																																																																																																				
Minimum hours needed to graduate		120.0																																																																																																																																																																																				

# BS in ELECTRICAL ENGINEERING (393550)

## 2001–2002

**Suggested Sequence of Courses\*:**

**FRESHMAN YEAR**

<u>1st Semester</u>	
ECEn 191 (FW)	0.5
Math 112 (FWSpSu)	4.0
CS 142 (FWSpSu)	3.0
RelA 121 (FWSpSu)	2.0
HEPE 129	2.0
1 <sup>st</sup> Year Writing	3.0
<b>Total Hours</b>	<b>14.5</b>

2nd Semester

Math 113 (FWSpSu)	4.0
Phscs 121 (FWSpSu)	3.0
ECEn124 (FWSu)	3.0
RelA 122 (FWSpSu)	2.0
AHtg 100	3.0
<b>Total Hours</b>	<b>15.0</b>

Spring Term

Phscs 220 (FWSpSu)	3.0
Arts and Letters elective	3.0
<b>Total Hours</b>	<b>6.0</b>

**SOPHOMORE YEAR**

<u>3rd Semester</u>	
ECEn 212 (FWSp)	5.0
Math 343 (FWSpSu)	3.0
RelA 211 or 212 (FWSpSu)	2.0
Social & Behavioral Science elective	3.0
<b>Total Hours</b>	<b>13.0</b>

4th Semester

ECEn 313 (FWSp)	4.0
ECEn 317 (FWSp)	1.0
ECEn 224 (FW)	3.0
Math 214 (FWSpSu)	3.0
Civilization 1	3.0
Religion elective	2.0
<b>Total Hours</b>	<b>16.0</b>

Spring Term

Chem 105 (FWSpSu)	4.0
Math 334 (FWSpSu)	3.0
<b>Total Hours</b>	<b>7.0</b>

**JUNIOR YEAR**

<u>5th Semester</u>	
CS 235 (FWSp)	4.0
ECEn 380 (FWSp)	5.0
Phscs 281 (F)	3.0
Biological Science	3.0
<b>Total Hours</b>	<b>15.0</b>

6th Semester

ECEn 360 (FW)	4.0
ECEn 361 (FW)	1.0
ECEn 4xx - adv. core elective	4.0
Stat 421 (FW)	3.0
RelC 324 or 325	2.0
<b>Total Hours</b>	<b>14.0</b>

**SENIOR YEAR**

<u>7th Semester</u>	
ECEn 4xx - adv. core elective	4.0
ECEn 4xx - adv. Core elective	4.0
Engl 312 or 316 (FWSpSu)	3.0
Civilization 2	3.0
Religion elective	2.0
<b>Total Hours</b>	<b>16.0</b>

8th Semester

ECEn 4xx - adv. core elective	4.0
Technical elective	4.0
ECEn 490	4.0
Religion elective	2.0
<b>Total Hours</b>	<b>14.0</b>

**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](http://www.ee.byu.edu) and review the undergraduate information.

**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.