# Electrical Engineering

**Energy Concentration**

## Plan of Study: 2016-2017 Academic Year

**Engineering & Design**  
516 High St., MS-9086  
Bellingham, WA 98225  
www.wwu.edu/engd

**Pre-major Advisor:**  
Lisa Ochs  
lisa.ochs@wwu.edu  
360 650 4132  
ET 204

**Planning Guide & Program Requirements**  
144-148 Total Credits for Major

*All students must initially declare as a pre-major in Electrical Engineering; students cannot apply for the Major unless all pre-major prerequisites have been satisfied with a grade of C- or better. Admission to the program is competitive.

## Pre-Major Courses Year 1

<table>
<thead>
<tr>
<th>GRADE</th>
<th>YEAR 1</th>
<th>Qtr.</th>
<th>Cr.</th>
<th>GRADE</th>
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<tr>
<td></td>
<td>CHEM 121</td>
<td>General Chemistry I</td>
<td>FWS</td>
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<tr>
<td></td>
<td>MATH 124*</td>
<td>Calc. &amp; Analytic Geom. I</td>
<td>FWS</td>
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<tr>
<td></td>
<td>PHYS 161*</td>
<td>Physics w/ Calculus I</td>
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<td></td>
<td>EE 110*</td>
<td>Intro to Electrical Engineering</td>
<td>W</td>
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<td></td>
<td>CSCI 140 or 141*</td>
<td>Programming Fundamentals</td>
<td>FWS</td>
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<td>MATH 125*</td>
<td>Calc. &amp; Analytic Geom. II</td>
<td>FWS</td>
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<tr>
<td></td>
<td>PHYS 162*</td>
<td>Physics w/ Calculus II</td>
<td>W</td>
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<td></td>
<td>EE 111*</td>
<td>Circuit Analysis</td>
<td>S</td>
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<td></td>
<td>MATH 204*</td>
<td>Linear Algebra</td>
<td>FWS</td>
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<td></td>
<td>PHYS 163</td>
<td>Physics w/ Calculus III</td>
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<td>GUR: B/CCOM</td>
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**Major Applications due end of Spring Quarter**

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## Major Courses Year 3 & Year 4

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<th>GRADE</th>
<th>YEAR 3</th>
<th>Qtr.</th>
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<th>GRADE</th>
<th>YEAR 4</th>
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<tr>
<td></td>
<td>EE 210</td>
<td>Circuit Analysis II</td>
<td>E</td>
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<tr>
<td></td>
<td>EE 233</td>
<td>Digital Electronics</td>
<td>E</td>
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<td></td>
<td>MATH 224</td>
<td>Multivariable Cal. &amp; Geom. I</td>
<td>FWS</td>
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<td></td>
<td>ENRG 270</td>
<td>Energy Science I</td>
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<td>EE 220</td>
<td>Electronics I</td>
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<td></td>
<td>EE 244</td>
<td>Embedded Microcontrollers I</td>
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<td>4</td>
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<td>MATH 331</td>
<td>Differential Equations</td>
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<td>EE 310</td>
<td>Continuous Systems</td>
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<td>ECON 206</td>
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<td>EE 344</td>
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<td>EE 372</td>
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<td>EE 320</td>
<td>Electronics II</td>
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<td>EE 360</td>
<td>Communications Systems</td>
<td>W</td>
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<td>EE 374</td>
<td>Energy Processing</td>
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<td></td>
<td>EE 361</td>
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<td>EE 380</td>
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<td>EE 381</td>
<td>Applied Electromagnetics</td>
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<td></td>
<td>EE 379</td>
<td>Smart &amp; Renewable Power</td>
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<td>ENRG 386</td>
<td>Economics of Electricity Mkt.</td>
<td>E</td>
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**NOTES:**

1. EE courses are only offered **once per year**, and have a strong prerequisite structure. Not following the sequence may delay graduation by one year. See reverse for approved list of technical electives.

2. Students not enrolled MATH 125 and PHYS 162 by Winter of Year 1 will not be able to complete the degree in four years.

3. CSCI 141 may be substituted for CSCI 140. MATH 341 may be substituted for MATH 345.

4. The EE program satisfies the SCI/LSCI, QSR, and Writing Proficiency (WP) General University Requirements (GURs). The GUR categories listed in this Planning Guide are what a student would need to complete beyond what the Major fulfills. Refer to the WWU Degree Planning Guide for further information and a list of GUR course options. [http://www.wwu.edu/depts/Registrar/gurs.shtml](http://www.wwu.edu/depts/Registrar/gurs.shtml)

5. All EE courses in years 2, 3, and 4 require admission to the EE Major (see reverse).

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**Updated 11.28.16**
ELECTRICAL ENGINEERING

Energy Concentration

Admissions—

Program Admissions: Admission to the Electrical Engineering major is a two-phase process. When students initially declare, they are designated as pre-majors. Students must complete the courses listed below in order to apply to the major. Admission to full major status is determined by academic performance as a pre-major and other factors. Admission to the major is competitive. Neither completion of the prerequisites nor attainment of any specific GPA guarantees admission.

Major Prerequisite courses: MATH 124, MATH 125, MATH 204, PHYS 161, PHYS 162, CSCI 140 or 141, EE 110, and EE 111. Students must obtain at least a C- in the above courses and an overall GPA in them of 2.0 or higher to be considered. AP scores are converted to GPA as follows: 5 = A; 4 = B; 3 = C. Decisions are based primarily on cumulative GPA in the prerequisite courses, but successful completion of other required Major courses, GPA in the major, and overall GPA are also considerations.

Spring Quarter: Applications are due by Noon on the Friday of Dead Week to ET 204. Only complete, on-time applications will be considered. Applicants will be notified by the end of the week following finals week. Students who are accepted must register for Fall quarter EE courses before the end of Phase I registration. Students who do not register by the end of Phase I registration may lose their major status.

Fall Quarter: Applications are also accepted at the beginning of Fall quarter on a space available basis. In order to be considered, applications are due to ET 204 by Noon on the Friday before the start of classes. Accepted students will be notified by the start of Phase III registration.

Transfer Students: A transfer student that will be transferring into Fall quarter, Year 2, will be designated as a pre-major and will need to follow the standard application process above except for EE 110, which must be taken at the first opportunity on-campus. A transfer student that has previous coursework that can be transferred to EE core courses and will be entering the program sequence after Fall quarter, Year 2, may apply at any time. Acceptance will be based on space availability and academic performance. Transfer students who are interested in pursuing the EE program should meet with the department Program Coordinator early to discuss their options.

Approved Technical Electives (6-10 credits total required): Other courses may be accepted; see program advisor.

BIOL 101 INTRODUCTION TO BIOLOGY (4)
BIOL 348 HUMAN ANATOMY AND PHYSIOLOGY (5)
CHEM 122 GENERAL CHEMISTRY II (5)
CHEM 123 GENERAL CHEMISTRY III (4)
CSCI 145 COMPUTER PROGRAM. & LINEAR DATA STRUCT. (4)
CSCI 247 COMPUTER SYSTEMS I (5)
CSCI 241 DATA STRUCTURES (4)
CSCI 301 FORMAL LANGUAGES & FUNCTIONAL PROGRAM. (5)
CSCI 305 ANALYSIS OF ALGORITHMS & DATA STRUCT. I (3)
CSCI 322 PRINCIPLES OF CONCURRENT PROGRAM. (3)
CSCI 345 OBJECT ORIENTED DESIGN (4)
CSCI 347 COMPUTER ORGANIZATION II (3)
CSCI 351 WINDOWS SOFTWARE DEVELOPMENT (3)
CSCI 352 UNIX SOFTWARE DEVELOPMENT (3)
CSCI 367 COMPUTER NETWORKS I (3)
CSCI 402 ARTIFICIAL INTELLIGENCE (3)
CSCI 405 DESIGN & ANALYSIS OF ADV ALGOR. & DATA STRUCT. (4)
CSCI 412 MOBILE DEVICE PROGRAMMING (4)
CSCI 442 ADVANCED WEB PROGRAMMING IN JAVA (3)
CSCI 460 OPERATING SYSTEMS (3)
CSCI 462 OS DEVICE DRIVERS (4)
CSCI 467 COMPUTER NETWORKS II (3)
EE 300 DIRECTED INDEPENDENT STUDY (1-15)
EE 311 DISCREET SYSTEMS (4)
EE 333 DIGITAL SYSTEM DESIGN (4)
EE 400 DIRECTED INDEPENDENT STUDY (1-15)
EE 433 DIGITAL SIGNAL PROCESSING (4)
EE 495 DIRECTED RESEARCH IN EE (1-3)
ENRG 360 ENERGY EFFICIENT DESIGN (4)
ENRG 370 ENERGY SCIENCE II (3)
ENRG 480 APPLICATIONS ENERGY PRODUCTION (4)
ENGR 170 INTRO TO MATERIALS SCIENCE & ENGR (4)
ENGR 214 STATICS (4)
ENGR 225 MECHANICS OF MATERIALS (5)
MATH 225 MULTIVARIABLE CALC. AND GEOM. II (4)
MATH 226 LIMITS AND INFINITE SERIES (4)
MATH 304 LINEAR ALGEBRA (4)
MATH 307 MATHEMATICAL COMPUTING (4)
MATH 342 STATISTICAL METHODS (4)
MFE 341 QUALITY ASSURANCE (4)
MFE 342 DESIGN OF EXPERIMENTS (4)
MFE 453 INDUSTRIAL ROBOTICS (4)
OPS 360 OPERATIONS MANAGEMENT (4)
OPS 460 DESIGNING AND IMPROVING OPERATIONS (4)
OPS 461 PROJECT MANAGEMENT (4)
OPS 463 ENTERPRISE RESOURCE PLANNING SYSTEMS (4)
PHYS 224 MODERN PHYSICS I (4)
PHYS 225 MODERN PHYSICS II (3)
PHYS 339 OPTICS (3)
PHYS 368 ELECTROMAGNETISM I (3)
PHYS 369 ELECTROMAGNETISM II (3)

Contact Information for Electrical Engineering professors:
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Xichen Jiang, Assistant Professor; Xichen.Jiang@wwu.edu; 360.650.7766; ET268

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