Electrical Engineering (Control & Power) - Bachelor of Science in Electrical Engineering

Overview
The Bachelor of Science in Electrical Engineering (BSEE) program of the Klipsch School is accredited by the Engineering Accreditation Commission of ABET, Inc. This particular concentration in the BSEE program gives students the opportunity to explore more deeply the area of control and power systems.

Electrical Engineering Program Educational Objectives
Below are the program educational objectives (PEOs) that describe the expected accomplishments of graduate during their first few years after graduation.

1. Our graduates will obtain relevant, productive employment in the private sector, government and/or pursue an advanced degree.
2. Our graduates will be using their engineering foundation to innovate solutions to the problems of the real world.

Requirements (121 credits)
Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 121 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix | Title | Credits
--- | --- | ---
**General Education** |  |  
**Area I: Communications** |  |  
*English Composition - Level 1* |  |  
ENGL 111G | Rhetoric and Composition | 4
*English Composition - Level 2* |  |  
|  | 3
**Area II: Mathematics** |  |  
MATH 191G | Calculus and Analytic Geometry I | 2
**Area III/IV: Laboratory Sciences and Social/Behavioral Sciences** |  |  
CHEM 111G | General Chemistry I | 1
PHYS 215G & 215GL | Engineering Physics I and Engineering Physics I Laboratory | 11
**Area IV: Social/Behavioral Sciences (3 credits)** |  |  
|  | 3
**Area V: Humanities** |  |  
|  | 3
**Area VI: Creative and Fine Arts** |  |  
|  | 3
**General Education Elective** |  |  
MATH 192G | Calculus and Analytic Geometry II | 4
**Viewing A Wider World** |  |  
|  | 3
Viewing a Wider World Electives (PHIL 323V strongly recommended) |  | 6
**Departmental/College Requirements** |  |  
**Program Specific Requirements** |  |  

**Mathematics and Natural Science**

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<tr>
<th>Prefix</th>
<th>Title</th>
<th>Credits</th>
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| MATH 392 | Introduction to Ordinary Differential Equations | 3
| PHYS 216G | Engineering Physics II | 3
| PHYS 216GL | Engineering Physics II Laboratory | 1
| EE 200 | Linear Algebra, Probability and Statistics Applications | 4
| EE 240 | Multivariate and Vector Calculus Applications | 3

**STEM**
Choose two STEM Electives | 6

**Electrical and Computer Engineering**

<table>
<thead>
<tr>
<th>Prefix</th>
<th>Title</th>
<th>Credits</th>
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| ENGR 100 | Introduction to Engineering (or choose third STEM Elective) | 3
| EE 100 | Introduction to Electrical and Computer Engineering | 4
| EE 112 | Embedded Systems | 4
| EE 212 | Introduction to Computer Organization | 4
| EE 230 | Circuit Analysis and Introduction to Electronics | 4
| EE 300 | Cornerstone Design | 2
| EE 317 | Semiconductor Devices and Electronics I | 4
| EE 320 | Signals and Systems I | 3
| EE 325 | Signals and Systems II | 4
| EE 333 | AC Circuit Analysis and Introduction to Power Systems | 3
| EE 340 | Fields and Waves | 4
| EE 402 | Capstone Design I | 3
| or ENGR 401 | Engineering Capstone I |  
| EE 404 | Capstone Design II | 3
| or ENGR 402 | Engineering Capstone II |  

| EE Concentration Required Courses |  |  
|---|---|---|
| EE 431 | Power Systems II | 3
| EE 493 | Power Systems III | 3

**EE Concentration Electives: Choose two courses from the following (one must be an EE course):**

<table>
<thead>
<tr>
<th>Prefix</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>EE 432</td>
<td>Power Electronics</td>
<td></td>
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<tr>
<td>EE 475</td>
<td>Automatic Control Systems</td>
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<tr>
<td>EE 476</td>
<td>Computer Control Systems</td>
<td></td>
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<tr>
<td>CS 343</td>
<td>Algorithm Design &amp; Implementation</td>
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<tr>
<td>CS 483</td>
<td>Introduction to Robotics</td>
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<tr>
<td>CHME 361</td>
<td>Engineering Materials</td>
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<td>ME 481</td>
<td>Alternative and Renewable Energy</td>
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<td>ME 487</td>
<td>Mechatronics</td>
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<td>MATH 480</td>
<td>Matrix Theory and Applied Linear Algebra</td>
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**Non-Departmental Requirements (in addition to Gen.Ed/ VWW)**

**Object-Oriented Programming**
Select one course from the following: | 3-4

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<tr>
<th>Prefix</th>
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<tbody>
<tr>
<td>CS 151</td>
<td>C++ Programming</td>
<td></td>
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<tr>
<td>CS 152</td>
<td>Java Programming</td>
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<tr>
<td>CS 154</td>
<td>Python Programming II</td>
<td></td>
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<tr>
<td>CS 172</td>
<td>Computer Science I</td>
<td></td>
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<tr>
<td>CS 271</td>
<td>Object Oriented Programming</td>
<td></td>
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Electrical Engineering (Control & Power) - Bachelor of Science in Electrical Engineering

Second Language: (not required)

Electives, to bring the total credits to 120

Total Credits 121-122

1. See the General Education section of the catalog for a full list of courses.

2. MATH 191G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 191G Calculus and Analytic Geometry I first.

3. See the Viewing a Wider World section of the catalog for a full list of courses.

4. STEM Elective: Course at the 300 level or above from E E that is not used to satisfy any other E E program requirement or courses at the 300 level or above from A E, C E, CHME, I E, M E, ASTR, BIOL, CHEM, C S, MATH, PHYS and STAT. Excluded courses include VWW courses and those which are substantially equivalent to an E E course. Click to view a list of excluded STEM Electives.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 191G Intermediate Algebra and ENGL 111G Rhetoric and Composition. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

Course | Title | Credits
--- | --- | ---
**First Year** | | |
**Fall** | | |
E E 100 | Introduction to Electrical and Computer Engineering | 4
ENGR 100 | Introduction to Engineering | 3
ENGL 111G | Rhetoric and Composition | 4
MATH 191G | Calculus and Analytic Geometry I | 4
Credits | 15

**Spring** | | |
CHEM 111G | General Chemistry I | 4
E E 112 | Embedded Systems | 4
MATH 192G | Calculus and Analytic Geometry II | 4
General Education Requirement (Area I, IV, V, VI or VWW) | 3
Credits | 15

**Second Year** | | |
**Fall** | | |
E E 212 | Introduction to Computer Organization | 4
E E 200 | Linear Algebra, Probability and Statistics Applications | 4
PHYS 215G & 215GL | Engineering Physics I and Engineering Physics I Laboratory | 4
General Education Requirement (Area I, IV, V, VI or VWW) | 3
Credits | 15

**Spring** | | |
MATH 392 | Introduction to Ordinary Differential Equations | 4
E E 230 | Circuit Analysis and Introduction to Electronics | 4
E E 240 | Multivariate and Vector Calculus Applications | 3
PHYS 216G & 216GL | Engineering Physics II and Engineering Physics II Laboratory | 4
General Education Requirement (Area I, IV, V, VI or VWW) | 3
Credits | 17

**Third Year** | | |
**Fall** | | |
E E 300 | Cornerstone Design | 2
E E 320 | Signals and Systems I | 3
E E 333 | AC Circuit Analysis and Introduction to Power Systems | 3
E E 340 | Fields and Waves | 4
General Education Requirement (Area I, IV, V, VI or VWW) | 3
Credits | 15

**Spring** | | |
E E 317 | Semiconductor Devices and Electronics I | 4
E E 352 | Signals and Systems II | 4
General Education Requirement (Area I, IV, V, VI or VWW) | 3
Credits | 18

**Fourth Year** | | |
**Fall** | | |
E E 402 | Capstone Design I or ENGR 401 Engineering Capstone I | 3
E E 431 | Power Systems II | 3
Control & Power Elective | 3
STEM Electives | 6
General Education Requirement (Area I, IV, V, VI or VWW) | 3
Credits | 18

**Spring** | | |
E E 404 | Capstone Design II or ENGR 402 Engineering Capstone II | 3
E E 493 | Power Systems III | 3
Choose one Object-Oriented Programming course from the following: | | |
C S 151 | C++ Programming | 3-4
C S 152 | Java Programming | 3-4
C S 154 | Python Programming II | 3-4
C S 172 | Computer Science I | 3-4
C S 271 | Object Oriented Programming | 3-4
Control & Power Elective | 3
Credits | 12-13

Total Credits 121-122

1. MATH 191G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 191G first.

2. See the required courses section of the catalog for a full list of courses.

3. Students must take both E E 431 Power Systems II and E E 493 Power Systems III
One Control & Power Elective Courses must be from the E E Prefix.

Control & Power Elective Courses:

- E E 432 Power Electronics, E E 475 Automatic Control Systems, E E 476 Computer Control Systems
- C S 343 Algorithm Design & Implementation, C S 483 Introduction to Robotics
- CHME 361 Engineering Materials
- M E 481 Alternative and Renewable Energy, M E 487 Mechatronics
- MATH 480 Matrix Theory and Applied Linear Algebra

STEM Elective: Course at the 300 level or above from E E that is not used to satisfy any other E E program requirement or courses at the 300 level or above from A E, C E, CHME, I E, M E, ASTR, BIOL, CHEM, C S, MATH, PHYS and STAT. Excluded courses include VWW courses and those which are substantially equivalent to an E E course. Click to view a list of excluded STEM Electives.