ELECTRICAL ENGINEERING, B.S.E.

1. An ability to perform system analysis by applying principles of engineering, science, and mathematics.
2. An ability to analyze electric and magnetic fields and waves, electronic devices and circuits.
3. An ability to perform complex systems analysis.
4. An ability to build, test and characterize electric circuits.
5. An ability to design and build complex systems that require both hardware and software as components of the system solution and that meet multiple criteria and fulfill specific needs.
6. An ability to communicate effectively in writing to technical and non-technical audiences, using a broad spectrum of text and graphical elements.
7. An ability to communicate effectively in oral presentations, with and without graphics support, to a variety of audiences, especially technical audiences.
8. Identifying and mitigating public, societal, and/or environmental risk factors associated with a project.
9. High-level considerations of ethical issues in commercialization plans, prototype system to market analysis.
10. An ability to work together towards common team goals, demonstrating effective collaboration, communication, diligence, and resourcefulness.
11. An ability to effectively evaluate, critique, and assist fellow team members, with an aim to develop their fullest capabilities.
12. An ability to design and conduct tests and validate performance.
13. An ability to analyze and interpret system performance.
14. An ability to find and apply technical information needed to apply complex electronic devices in the development of system solutions.
15. An ability to research, locate, and explain the state of the art of a technology needed to satisfy some system solution and to use that information in an analysis of alternatives to identify a promising implementation option.

Academic Standards

Program GPA
Program GPA requirement policies are described in the College of Engineering and Computing section of this bulletin. For the purpose of these policies, the following courses are used to determine the Program GPA for the Electrical Engineering B.S.E. program: all Lower Division Engineering courses, all Electrical Engineering Major courses, and all Career Plan Elective courses.

Admissions

Entrance Requirements
Admission requirements and processes for freshman, transfer students, and former students seeking readmission are managed by the Office of Undergraduate Admissions (http://sc.edu/about/offices_and_divisions/undergraduate_admissions/).

Transfer applicants from regionally accredited colleges and universities must have a cumulative 2.75 GPA on a 4.00 scale to enter the College of Engineering and Computing. In addition, transfer applicants for the Aerospace Engineering, Biomedical Engineering, Chemical Engineering, Chemical Engineering, Computer Engineering, Electrical Engineering, or Mechanical Engineering majors must also have completed a four semester-hour calculus course equivalent to MATH 141 with a grade of "C" or better.

Current University of South Carolina students who wish to enter the College of Engineering and Computing, and former students seeking readmission, must have an institutional GPA of 2.50 or better on at least 15 hours earned at UofSC. In addition, such applicants for the Aerospace Engineering, Biomedical Engineering, Chemical Engineering, Civil Engineering, Computer Engineering, Electrical Engineering, or Mechanical Engineering majors must also have completed a four semester-hour calculus course equivalent to MATH 141 with a grade of "C" or better.

Degree Requirements (127-141 hours)
See College of Engineering and Computing (https://academicbulletins.sc.edu/undergraduate/engineering-computing/) for progression requirements and special academic opportunities.

Program of Study

Requirements | Credit Hours
---|---
1. Carolina Core | 34-46
2. College Requirements | 0
3. Program Requirements | 66-68
4. Major Requirements | 27

Founding Documents Requirement
All undergraduate students must take a 3-credit course or its equivalent with a passing grade in the subject areas of History, Political Science, or African American Studies that covers the founding documents including the United States Constitution, the Declaration of Independence, the Emancipation Proclamation and one or more documents that are foundational to the African American Freedom struggle, and a minimum of five essays from the Federalist papers. This course may count as a requirement in any part of the program of study including the Carolina Core, the major, minor or cognate, or as a general elective. Courses that meet this requirement are listed here (https://academicbulletins.sc.edu/undergraduate/founding-document-courses/).

1. Carolina Core Requirements (34-46 hours)

CMW – Effective, Engaged, and Persuasive Communication: Written (6 hours)
Must be passed with a grade of C or higher.
- ENGL 101
- ENGL 102

ARP – Analytical Reasoning and Problem Solving (8 hours)
Must be passed with a grade of C or higher.
- MATH 141
- MATH 142

SCI – Scientific Literacy (8 hours)
Must be passed with a grade of C or higher.
- MATH 141
- MATH 142

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• CHEM 111 & CHEM 111L  
• PHYS 211 & PHYS 211L  

**GFL – Global Citizenship and Multicultural Understanding: Foreign Language (0-6 hours)**
Score two or better on foreign language placement test; or complete the 109 and 110 courses in FREN, GERM, LATN or SPAN; or complete the 121 course in another foreign language.

• CC-GFL courses (https://academicbulletins.sc.edu/undergraduate/carolina-core-courses/)

**GHS – Global Citizenship and Multicultural Understanding: Historical Thinking (3 hours)**
• any CC-GHS course (https://academicbulletins.sc.edu/undergraduate/carolina-core-courses/)

**GSS – Global Citizenship and Multicultural Understanding: Social Sciences (3 hours)**
• any CC-GSS course (https://academicbulletins.sc.edu/undergraduate/carolina-core-courses/)

**AIU – Aesthetic and Interpretive Understanding (3 hours)**
• any CC-AIU course (https://academicbulletins.sc.edu/undergraduate/carolina-core-courses/)

**CMS – Effective, Engaged, and Persuasive Communication: Spoken Component 1 (0-3 hours)**
Select from the following:

• PHIL 325 (CMS/VSR overlay)
• any overlay or stand-alone CC-CMS course (https://academicbulletins.sc.edu/undergraduate/carolina-core-courses/)

**INF – Information Literacy 1 (0-3 hours)**
• any overlay or stand-alone CC-INF course (https://academicbulletins.sc.edu/undergraduate/carolina-core-courses/)

**VSR – Values, Ethics, and Social Responsibility 1 (0-3 hours)**
Select from the following:

• PHIL 325 (CMS/VSR overlay)
• any overlay or stand-alone CC-VSR course (https://academicbulletins.sc.edu/undergraduate/carolina-core-courses/)

1 Carolina Core Stand Alone or Overlay Eligible Requirements — Overlay-approved courses offer students the option of meeting two Carolina Core components in a single course. A maximum of two overlays is allowed. The total Carolina Core credit hours for this program must add up to a minimum of 34 hours.

## 2. College Requirements (0 hours)
No college-required courses for this program.

### 3. Program Requirements (66-68 hours)

#### Supporting Courses (66-68 hours)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foundational Courses</td>
<td>Foundational Courses</td>
<td></td>
</tr>
<tr>
<td>UNIV 101</td>
<td>The Student in the University</td>
<td>3</td>
</tr>
<tr>
<td>EMCH 220</td>
<td>Mechanical Engineering Fundamentals for Non-Majors</td>
<td>3</td>
</tr>
<tr>
<td>MATH 241</td>
<td>Vector Calculus (must be passed with a grade of C or higher)</td>
<td>3</td>
</tr>
<tr>
<td>MATH 242</td>
<td>Elementary Differential Equations (must be passed with a grade of C or higher)</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 212</td>
<td>Essentials of Physics II (must be passed with a grade of C or higher)</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 212L</td>
<td>Essentials of Physics II Lab (must be passed with a grade of C or higher)</td>
<td>1</td>
</tr>
<tr>
<td>STAT 509</td>
<td>Statistics for Engineers</td>
<td>3</td>
</tr>
</tbody>
</table>

| Lower Division Engineering | Lower Division Engineering | |
| CSCE 145 | Algorithmic Design I (must be passed with a grade of C or higher) | 4       |
| CSCE 211 | Digital Logic Design (must be passed with a grade of C or higher) | 3       |
| CSCE 212 | Introduction to Computer Architecture          | 3       |
| CSCE 313 | Embedded Systems                                | 3       |
| ELCT 101 | Electrical and Electronics Engineering          | 1-3     |
| ELCT 102 | Electrical Science                              | 3       |
| ELCT 201 | Introductory Electrical Engineering Laboratory | 3       |
| ELCT 221 | Circuits (must be passed with a grade of C or higher) | 3       |
| ELCT 222 | Signals and Systems (must be passed with a grade of C or higher) | 3       |

Total Credit Hours 45-47

#### Career Plan Electives (18 hours)
The student will select 18 hours of Career Plan Electives. These include ELCT courses numbered 430 and higher. These may include up to 6 hours of non-ELCT courses at the 300 level or higher with department approval. Other courses may be approved by the department. Courses can not duplicate a course otherwise applied to the degree.

#### General Elective (3 hours)
The student will select an additional 3 credit hours to satisfy the General Elective. These include any university course that does not essentially duplicate a course otherwise applied to the degree.

### 4. Major Requirements (27 hours)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ELCT 301</td>
<td>Electronics Laboratory</td>
<td>3</td>
</tr>
<tr>
<td>ELCT 302</td>
<td>Real Time Systems Laboratory</td>
<td>3</td>
</tr>
<tr>
<td>ELCT 321</td>
<td>Digital Signal Processing</td>
<td>3</td>
</tr>
<tr>
<td>ELCT 331</td>
<td>Control Systems</td>
<td>3</td>
</tr>
<tr>
<td>ELCT 361</td>
<td>Electromagnetics</td>
<td>3</td>
</tr>
<tr>
<td>ELCT 363</td>
<td>Introduction to Microelectronics</td>
<td>3</td>
</tr>
<tr>
<td>ELCT 371</td>
<td>Electronics</td>
<td>3</td>
</tr>
</tbody>
</table>
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<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ELCT 403</td>
<td>Capstone Design Project I</td>
<td>3</td>
</tr>
<tr>
<td>ELCT 404</td>
<td>Capstone Design Project II</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total Credit Hours</strong></td>
<td></td>
<td><strong>27</strong></td>
</tr>
</tbody>
</table>

**Major Map**

A major map is a layout of required courses in a given program of study, including critical courses and suggested course sequences to ensure a clear path to graduation.

Major maps are only a suggested or recommended sequence of courses required in a program of study. Please contact your academic advisor for assistance in the application of specific coursework to a program of study and course selection and planning for upcoming semesters.

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