COMPUTER ENGINEERING, B.S.E.

Accreditation

Learning Outcomes
• Students will demonstrate an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
• Students will demonstrate an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
• Students will demonstrate an ability to communicate effectively with a range of audiences.
• Students will demonstrate an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
• Students will demonstrate an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
• Students will demonstrate an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
• Students will demonstrate an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

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 Computer Engineering B.S.E. program: all Lower Division Computing courses, Computer Engineering Major, Computer Engineering Electives, Electrical Engineering courses, and CSCE 390.

Exclusions
No Computer Engineering course may be counted toward a minor. All other required courses and electives may be used for a minor as appropriate. CSCE 101 and CSCE 102 are not major courses and may not be used for degree credit.

Minimum Course Grades
The Computer Engineering B.S.E. program requires that a grade of "C" or better be earned in each of the following courses: ENGL 101, ENGL 102, MATH 141, MATH 142, MATH 374, PHYS 211, PHYS 211L, and all CSCE courses applied to the degree.

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, 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.

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.

The last 25% of a student’s degree must be completed in residence at the University, and at least half of the hours in the student’s major courses and in the student’s minor courses (if applicable) must be taken at the University.

Degree Requirements (125-134 hours)
See College of Engineering and Computing (https://academicbulletins.sc.edu/undergraduate/engineering-computing/) for progression requirements and special academic opportunities.

Program of Study

<table>
<thead>
<tr>
<th>Requirements</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Carolina Core</td>
<td>35-44</td>
</tr>
<tr>
<td>2. College Requirements</td>
<td>0</td>
</tr>
<tr>
<td>3. Program Requirements</td>
<td>57</td>
</tr>
<tr>
<td>4. Major Requirements</td>
<td>33</td>
</tr>
</tbody>
</table>

1. Carolina Core Requirements (35-44 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)
  • CHEM 111 & CHEM 111L
  • PHYS 211 & PHYS 211L - must be passed with a grade of C or higher

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 (3 hours)
  • SPCH 140 or SPCH 230

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 (1 hour)
  • CSCE 390 - must be passed with a grade of C or higher

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

3. Program Requirements (57 hours)
Supporting Courses (57 hours)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 241</td>
<td>Vector Calculus</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>MATH 344</td>
<td>Applied Linear Algebra</td>
<td>3</td>
</tr>
</tbody>
</table>

MATH 344L  Applied Linear Algebra Lab  1
MATH 374  Discrete Structures (must be passed with a grade of C or higher)  3
PHYS 212  Essentials of Physics II  3
PHYS 212L  Essentials of Physics II Lab  1
STAT 509  Statistics for Engineers  3
ENGL 462  Technical Writing  3
or ENGL 463  Business Writing  3

Lower Division Computing
Must be passed with a grade of C or higher.
CSCE 145  Algorithmic Design I  4
CSCE 146  Algorithmic Design II  4
CSCE 190  Computing in the Modern World  1
CSCE 211  Digital Logic Design  3
CSCE 212  Introduction to Computer Architecture  3
CSCE 215  UNIX/Linux Fundamentals  1
CSCE 240  Advanced Programming Techniques  3
CSCE 274  Robotic Applications and Design  3

Electrical Engineering
ELCT 102  Electrical Science (must be passed with a grade of C or higher)  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  57

4. Major Requirements (33 hours)
Must be passed with a grade of C or higher.

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>CSCE 311</td>
<td>Operating Systems</td>
<td>3</td>
</tr>
<tr>
<td>CSCE 313</td>
<td>Embedded Systems</td>
<td>3</td>
</tr>
<tr>
<td>CSCE 350</td>
<td>Data Structures and Algorithms</td>
<td>3</td>
</tr>
<tr>
<td>CSCE 416</td>
<td>Introduction to Computer Networks</td>
<td>3</td>
</tr>
<tr>
<td>CSCE 490</td>
<td>Capstone Computing Project I</td>
<td>3</td>
</tr>
<tr>
<td>CSCE 491</td>
<td>Capstone Computer Engineering Project</td>
<td>3</td>
</tr>
<tr>
<td>CSCE 492</td>
<td>Capstone Computing Project II</td>
<td>3</td>
</tr>
<tr>
<td>CSCE 611</td>
<td>Advanced Digital Design</td>
<td>3</td>
</tr>
</tbody>
</table>

Major Electives
Select 9 hours of the following:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
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</tr>
</thead>
<tbody>
<tr>
<td>CSCE 330</td>
<td>Programming Language Structures</td>
<td>3</td>
</tr>
<tr>
<td>CSCE 355</td>
<td>Foundations of Computation</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>
</tbody>
</table>

Total Credit Hours  33

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 35 hours.
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.

Computer Engineering, B.S.E. (https://sc.edu/about/offices_and_divisions/advising/documents/major_maps/2020-2021/2020_computer-engr_map.pdf)