CIVIL ENGINEERING, B.S.E.

Communications and Ethics
This requirement is satisfied by completing one or more program-accepted Carolina Core courses for CMS and VSR.

Degree Requirements (124-142 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>34-46</td>
</tr>
<tr>
<td>2. College Requirements</td>
<td>0</td>
</tr>
<tr>
<td>3. Program Requirements</td>
<td>65-71</td>
</tr>
<tr>
<td>4. Major Requirements</td>
<td>25</td>
</tr>
</tbody>
</table>

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)
- ENGL 101
- ENGL 102

ARP – Analytical Reasoning and Problem Solving (8 hours)
- MATH 141
- MATH 142

SCI – Scientific Literacy (8 hours)
- 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)
- SPCH 140
- 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)
- PHIL 322
- 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 (65-71 hours)
Supporting Courses (65-71 hours)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Foundational Required Courses</td>
<td>6</td>
</tr>
<tr>
<td>MATH 242</td>
<td>Elementary Differential Equations</td>
<td></td>
</tr>
<tr>
<td>STAT 509</td>
<td>Statistics for Engineers</td>
<td></td>
</tr>
<tr>
<td>or STAT 511</td>
<td>Probability</td>
<td></td>
</tr>
</tbody>
</table>

Foundational Math Elective 3
Select one from the following:
- MATH 241 | Vector Calculus


MATH 300  Transition to Advanced Mathematics
MATH 344  Applied Linear Algebra

**Foundational Math/Science Elective**  3-4
Select one from the following:
- Additional course from Foundational Math Elective category
- CHEM 112  General Chemistry II
  & 112L  and General Chemistry II Lab
- PHYS 212  Essentials of Physics II
  & 212L  and Essentials of Physics II Lab

**Lower Division Engineering**  18
- ECIV 101  Introduction to Civil Engineering
  or ENCP 101  Introduction to Engineering
- ECIV 111  Introduction to Engineering Graphics andVisualization
  or ENCP 102  Introduction to Computer-Aided Design
- ECIV 200  Statics
  or ENCP 200  Statics
- ECIV 201  Computational Methods for Civil Engineering
  or ENCP 201  Introduction to Applied Numerical Methods
- ECIV 220  Mechanics of Solids
  or ENCP 260  Introduction to the Mechanics of Solids
- ECIV 360  Fluid Mechanics
  or ENCP 360  Fluid Mechanics

**ECIV Laboratory Courses**  2
Select two from the following:
- ECIV 303L  Civil Engineering Materials Laboratory
- ECIV 330L  Geotechnical Laboratory
- ECIV 340L  Transportation Engineering Laboratory
- ECIV 350L  Introduction to Environmental Engineering Laboratory
- ECIV 362L  Introduction to Water Resources Engineering Laboratory

**ECIV Distribution Courses**  12
Select one course from four of the following five areas:
- **Environmental Engineering**
  - ECIV 551  Elements of Water and Wastewater Treatment
  - ECIV 555  Principles of Municipal Solid Waste Engineering
  - ECIV 556  Air Pollution Control Engineering
  - ECIV 557  Sustainable Construction for Engineers
  - ECIV 558  Environmental Engineering Process Modeling
- **Structural Engineering**
  - ECIV 325  Structural Steel Design
  - ECIV 327  Reinforced Concrete Design
  - Transportation Engineering
- **Geotechnical Engineering**
  - ECIV 540  Transportation Systems Planning
  - ECIV 541  Highway Design
  - ECIV 542  Traffic Engineering
- **Railway Engineering**
  - ECIV 580  Railway Engineering I
- **Water Resources Engineering**
  - ECIV 560  Open Channel Hydraulics
  - ECIV 562  Engineering Hydrology
  - ECIV 563  Subsurface Hydrology

**Basic Science Elective**  3-4
Select one from the following:
- BIOL 110  General Biology
- BIOL 270  Introduction to Environmental Biology
- ENVR 101  Introduction to the Environment
- ENVR 321  Environmental Pollution and Health
- GEOL 101  Introduction to the Earth
- GEOL 103  Environment of the Earth
- MSCI 210  Oceans and Society
- MSCI 215  Coastal Environments of the Southeastern US

**Engineering, Science, or Mathematics (ESM) Electives**  12-14
Select from the following:
- Additional courses from Foundational Math Elective category,
  Foundational Math/Science Elective category and Basic Science Elective
- Additional ECIV courses 300 level and higher
- BIOL 101  Biological Principles I
- BIOL 102  Biological Principles II
- BIOL 250  Microbiology (and higher)
- BMEN 212  Fundamentals of Biomedical Systems (and higher)
- CHEM 118  Computational Chemistry I (and higher)
- CSCE 145  Algorithmic Design I
- CSCE 146  Algorithmic Design II
- CSCE 201  Introduction to Computer Security
- CSCE 206  Scientific Applications Programming
- CSCE 211  Digital Logic Design
- ECHE 300  Chemical Process Principles (and higher)
- ECIV 210  Dynamics
  or ENCP 210  Dynamics
- ELCT 220  Electrical Engineering for Non-Majors
- ELCT 221  Circuits (and higher)
- EMCH 290  Thermodynamics (or higher (but not ENCP 360)
- ENCP 290  Thermodynamic Fundamentals (and higher (but not ENCP 360)
- ENVR 331  Integrating Sustainability (and higher (but not
  ENCP 360)
- ENVR 501  Special Topics in the Environment
- ENVR 533  Sustainability Projects Course
- GEOG 347  Water as a Resource
- GEOG 563  Advanced Geographic Information Systems
- GEOL 302  Rocks and Minerals (or above)
- ITEC 233  Introduction to Computer Hardware and Software
  (or higher)
- MATH 520  Ordinary Differential Equations
- MATH 521  Boundary Value Problems and Partial Differential
  Equations
- MATH 544  Linear Algebra
- MATH 550  Vector Analysis
- MSCI 305  Ocean Data Analysis (and above)
- NAVY 201  Naval Ships Systems I (and higher)
- NAVY 202  Naval Ships Systems II
<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYS 291</td>
<td>Einstein's Relativity: Understanding by Example (and higher)</td>
<td></td>
</tr>
<tr>
<td>NAVY 301</td>
<td>Navigation/Naval Operations I</td>
<td></td>
</tr>
<tr>
<td>STAT 511</td>
<td>Probability</td>
<td></td>
</tr>
<tr>
<td>STAT 512</td>
<td>Mathematical Statistics</td>
<td></td>
</tr>
<tr>
<td>STAT 513</td>
<td>Theory of Statistical Inference</td>
<td></td>
</tr>
<tr>
<td>STAT 516</td>
<td>Statistical Methods II</td>
<td></td>
</tr>
<tr>
<td>STAT 520</td>
<td>Forecasting and Time Series</td>
<td></td>
</tr>
<tr>
<td>STAT 587</td>
<td>Big Data Analytics</td>
<td></td>
</tr>
<tr>
<td><strong>Career Electives</strong></td>
<td>6</td>
<td></td>
</tr>
<tr>
<td><strong>Select two courses from the following:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Additional courses from Foundational Math Elective category, Foundational Math/Science Elective category, Basic Science category and ESM Elective category.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Additional ECIV courses 300 level and higher</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ACCT 222</td>
<td>Survey of Accounting</td>
<td></td>
</tr>
<tr>
<td>ECON 224</td>
<td>Introduction to Economics</td>
<td></td>
</tr>
<tr>
<td>FINA 333</td>
<td>Finance and Markets</td>
<td></td>
</tr>
<tr>
<td>MGMT 371</td>
<td>Principles of Management</td>
<td></td>
</tr>
<tr>
<td>MGSC 290</td>
<td>Computer Information Systems in Business</td>
<td></td>
</tr>
<tr>
<td>MKTG 350</td>
<td>Principles of Marketing</td>
<td></td>
</tr>
</tbody>
</table>

**Total Credit Hours** 65-69

### 4. Major Requirements (25 hours)

#### Major Courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECIV 303</td>
<td>Civil Engineering Materials</td>
<td>3</td>
</tr>
<tr>
<td>ECIV 307</td>
<td>Professional Development for Civil Engineers</td>
<td>3</td>
</tr>
<tr>
<td>ECIV 320</td>
<td>Structural Analysis I</td>
<td>3</td>
</tr>
<tr>
<td>ECIV 330</td>
<td>Introduction to Geotechnical Engineering</td>
<td>3</td>
</tr>
<tr>
<td>ECIV 340</td>
<td>Introduction to Transportation Engineering</td>
<td>3</td>
</tr>
<tr>
<td>ECIV 350</td>
<td>Introduction to Environmental Engineering</td>
<td>3</td>
</tr>
<tr>
<td>ECIV 362</td>
<td>Introduction to Water Resources Engineering</td>
<td>3</td>
</tr>
<tr>
<td>ECIV 470</td>
<td>Civil Engineering Design</td>
<td>4</td>
</tr>
</tbody>
</table>

**Total Credit Hours** 25