AEROSPACE ENGINEERING, B.S.E.

Degree Requirements (125-137 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>46</td>
</tr>
<tr>
<td>4. Major Requirements</td>
<td>45</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 – must be passed with a grade of C or higher
- 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
- 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)
- 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)
- 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 (46 hours)

Supporting Courses (46 hours)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 112</td>
<td>General Chemistry II</td>
<td>3</td>
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<tr>
<td>CHEM 112L</td>
<td>General Chemistry II Lab</td>
<td>1</td>
</tr>
<tr>
<td>MATH 241</td>
<td>Vector Calculus</td>
<td>3</td>
</tr>
<tr>
<td>MATH 242</td>
<td>Elementary Differential Equations</td>
<td>3</td>
</tr>
<tr>
<td>MATH 344</td>
<td>Applied Linear Algebra</td>
<td>3</td>
</tr>
<tr>
<td>ELCT 220</td>
<td>Electrical Engineering for Non-Majors</td>
<td>3</td>
</tr>
<tr>
<td>or ELCT 221</td>
<td>Circuits</td>
<td></td>
</tr>
<tr>
<td>STAT 509</td>
<td>Statistics for Engineers</td>
<td>3</td>
</tr>
</tbody>
</table>

Lower Division Engineering
Aerospace Engineering, B.S.E.

**AESP 101**  
Introduction into Aerospace Engineering  
3

or **ENCP 101**  
Introduction to Engineering I  
3

**EMCH 111**  
Introduction to Computer-Aided Design  
3

or **ENCP 102**  
Introduction to Engineering II  
3

**EMCH 200**  
Statics (must be passed with a grade of C or higher)  
3

or **ENCP 200**  
Statics  
3

**EMCH 201**  
Introduction to Applied Numerical Methods  
3

or **ENCP 201**  
Introduction to Applied Numerical Methods  
3

**EMCH 260**  
Solid Mechanics  
3

or **ENCP 260**  
Introduction to the Mechanics of Solids  
3

**EMCH 290**  
Thermodynamics  
3

or **ENCP 290**  
Thermodynamic Fundamentals  
3

**Aerospace Engineering Electives**

Select nine hours from the following:  
9

- **EMCH 377**  
Manufacturing  

- **EMCH 354**  
Heat Transfer  

- **EMCH 332**  
Kinematics  

- **AESP 460**  
Special Problems: Aerospace Engineering  

- **AESP 543**  
Aerospace Propulsion  

- **EMCH 585**  
Introduction to Composite Materials  

- **EMCH 535**  
Robotics in Mechanical Engineering  

- **EMCH 544**  
Compressible Fluid Flow  

- **EMCH 530**  
Introduction to Engineering Optimization  

- **EMCH 592**  
Introduction to Combustion  

- **EMCH 516**  
Control Theory in Mechanical Engineering  

- **EMCH 578**  
Introduction to Aerodynamics  

- **EMCH 532**  
Intermediate Dynamics  

- **EMCH 564**  
Intermediate Heat Transfer  

- **EMCH 560**  
Intermediate Fluid Mechanics  

- **ELCT 221**  
Circuits  

- **ELCT 222**  
Signals and Systems  

- **ELCT 321**  
Digital Signal Processing  

- **ELCT 361**  
Electromagnetics  

- **ELCT 371**  
Electronics  

- **ELCT 331**  
Control Systems  

- **ELCT 572**  
Power Electronics  

- **ELCT 531**  
Digital Control Systems  

- **ELCT 562**  
Wireless Communications  

- **ELCT 564**  
RF Circuit Design for Wireless Communications  

**Total Credit Hours**  
45

**4. Major Requirements (45 hours)**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>AESP 265</td>
<td>Aerodynamics I Incompressible Flow</td>
<td>3</td>
</tr>
<tr>
<td>AESP 314</td>
<td>Energy Power and Propulsion</td>
<td>3</td>
</tr>
<tr>
<td>AESP 350</td>
<td>Aerospace Systems</td>
<td>3</td>
</tr>
<tr>
<td>AESP 361</td>
<td>Aerospace Laboratory I</td>
<td>3</td>
</tr>
<tr>
<td>AESP 362</td>
<td>Aerospace Laboratory II</td>
<td>3</td>
</tr>
<tr>
<td>AESP 420</td>
<td>Flight and Orbital Mechanics</td>
<td>3</td>
</tr>
<tr>
<td>AESP 428</td>
<td>Design I</td>
<td>3</td>
</tr>
<tr>
<td>AESP 466</td>
<td>Flight Dynamics and Control</td>
<td>3</td>
</tr>
<tr>
<td>EMCH 310</td>
<td>Dynamics</td>
<td>3</td>
</tr>
<tr>
<td>or ENCP 210</td>
<td>Dynamics</td>
<td></td>
</tr>
<tr>
<td>EMCH 330</td>
<td>Mechanical Vibrations</td>
<td>3</td>
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<tr>
<td>or ENCP 330</td>
<td>Introduction to Vibrations</td>
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<tr>
<td>EMCH 371</td>
<td>Materials</td>
<td>3</td>
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<tr>
<td>AESP 365</td>
<td>Aerodynamics II: Compressible Flow</td>
<td>3</td>
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<tr>
<td>EMCH 577</td>
<td>Aerospace Structures I</td>
<td>3</td>
</tr>
<tr>
<td>EMCH 308</td>
<td>Introduction to Finite Element Stress Analysis</td>
<td>3</td>
</tr>
<tr>
<td>AESP 415</td>
<td>Aircraft Design Part I Basics</td>
<td>3</td>
</tr>
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</table>

**Total Credit Hours**  
46