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)

<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>
</tr>
<tr>
<td>CHEM 112L</td>
<td>General Chemistry II Lab</td>
<td>1</td>
</tr>
<tr>
<td>ELCT 220</td>
<td>Electrical Engineering for Non-Majors or ELCT 221 Circuits</td>
<td>3</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>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
EMCH 111  Introduction to Computer-Aided Design  3
or ENCP 102  Introduction to Computer-Aided Design
EMCH 200  Statics (must be passed with a grade of C or higher)  3
or ENCP 200  Statics
EMCH 201  Introduction to Applied Numerical Methods  3
or ENCP 201  Introduction to Applied Numerical Methods
EMCH 260  Solid Mechanics  3
or ENCP 260  Introduction to the Mechanics of Solids
EMCH 290  Thermodynamics  3
or ENCP 290  Thermodynamic Fundamentals

Aerospace Engineering Electives
Select nine hour from the following:  9
AESP 460  Special Problems: Aerospace Engineering
AESP 543  Aerospace Propulsion
ELCT 221  Circuits
ELCT 222  Signals and Systems
ELCT 321  Digital Signal Processing
ELCT 331  Control Systems
ELCT 361  Electromagnetics
ELCT 371  Electronics
ELCT 531  Digital Control Systems
ELCT 562  Wireless Communications
ELCT 564  RF Circuit Design for Wireless Communications
ELCT 572  Power Electronics
EMCH 332  Kinematics
EMCH 354  Heat Transfer
EMCH 377  Manufacturing
EMCH 516  Control Theory in Mechanical Engineering
EMCH 530  Introduction to Engineering Optimization
EMCH 532  Intermediate Dynamics
EMCH 535  Robotics in Mechanical Engineering
EMCH 544  Compressible Fluid Flow
EMCH 554  Intermediate Heat Transfer
EMCH 560  Intermediate Fluid Mechanics
EMCH 578  Introduction to Aerodynamics
EMCH 585  Introduction to Composite Materials
EMCH 592  Introduction to Combustion

Total Credit Hours  45

4. Major Requirements (45 hours)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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</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 365</td>
<td>Aerodynamics II: Compressible Flow</td>
<td>3</td>
</tr>
<tr>
<td>AESP 415</td>
<td>Aircraft Design Part I Basics</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 308</td>
<td>Introduction to Finite Element Stress Analysis</td>
<td>3</td>
</tr>
<tr>
<td>EMCH 310</td>
<td>Dynamics</td>
<td>3</td>
</tr>
<tr>
<td>EMCH 330</td>
<td>Mechanical Vibrations</td>
<td>3</td>
</tr>
<tr>
<td>EMCH 371</td>
<td>Materials</td>
<td>3</td>
</tr>
<tr>
<td>EMCH 577</td>
<td>Aerospace Structures I</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Credit Hours  46