AEROSPACE ENGINEERING, B.S.E.

Degree Requirements (126-138 hours)
See College of Engineering and Computing (https://academicbulletins.sc.edu/undergraduate/engineering-computing/) for progression requirements and special academic opportunities.

Program of Study

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<th>Requirements</th>
<th>Credit Hours</th>
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<td>1. Carolina Core</td>
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<td>2. College Requirements</td>
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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 (53 hours)
Supporting Courses (53 hours)

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<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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<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>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>PHYS 212</td>
<td>Essentials of Physics II</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 212L</td>
<td>Essentials of Physics II Lab</td>
<td>1</td>
</tr>
<tr>
<td>STAT 509</td>
<td>Statistics for Engineers</td>
<td>3</td>
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Lower Division Engineering
AESP 101  Introduction into Aerospace Engineering  3
or ENCP 101  Introduction to Engineering I
EMCH 111  Introduction to Computer-Aided Design  3
or ENCP 102  Introduction to Engineering II
EMCH 200  Statics (must be passed with a grade of C or higher)  3
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

Track Electives
Select one of the following tracks:  15

Aeromechanical Systems:
AESP 415  Aircraft Design Part I Basics
EMCH 585  Introduction to Composite Materials
EMCH 308  Introduction to Finite Element Stress Analysis
Select two of the following:
EMCH 332  Kinematics
EMCH 354  Heat Transfer
EMCH 535  Robotics in Mechanical Engineering
EMCH 544  Compressible Fluid Flow
EMCH 530  Introduction to Engineering Optimization

Integrated Information Technology:
ITEC 233  Introduction to Computer Hardware and Software
ITEC 245  Introduction to Networking
Select two of the following:
ITEC 444  Introduction to Human Computer Interaction
ITEC 445  Advanced Networking
ITEC 493  Information Technology Security for Managers
Select one of the following:
ITEC 370  Database Systems in Information Technology
or ITEC 447  Management of Information Technology

Power Electronics Systems:
ELCT 221  Circuits
ELCT 222  Signals and Systems
ELCT 371  Electronics
ELCT 331  Control Systems
ELCT 572  Power Electronics

Control Systems:
ELCT 221  Circuits
ELCT 222  Signals and Systems
ELCT 371  Electronics
ELCT 331  Control Systems
ELCT 531  Digital Control Systems

Communication Systems:
ELCT 221  Circuits
ELCT 222  Signals and Systems
Select three of the following:
ELCT 321  Digital Signal Processing
ELCT 361  Electromagnetics

ELCT 562  Wireless Communications
ELCT 564  RF Circuit Design for Wireless Communications

Total Credit Hours
53

4. Major Requirements (39 hours)
Course  Title  Credits
AESP 265  Aerodynamics I Incompressible Flow  3
AESP 314  Energy Power and Propulsion  3
AESP 350  Aerospace Systems  3
AESP 361  Aerospace Laboratory I  3
AESP 362  Aerospace Laboratory II  3
AESP 420  Flight and Orbital Mechanics  3
AESP 428  Design I  3
AESP 466  Flight Dynamics and Control  3
EMCH 310  Dynamics  3
or ENCP 210  Dynamics
EMCH 330  Mechanical Vibrations  3
or ENCP 330  Introduction to Vibrations
EMCH 371  Materials  3
EMCH 377  Manufacturing  3
EMCH 577  Aerospace Structures I  3

Total Credit Hours 39