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 I</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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Aerospace Engineering, B.S.E.

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

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 53
Total Credit Hours 39