AEROSPACE ENGINEERING, B.S.E.

Degree Requirements (126-138 hours)

See College of Engineering and Computing (https://academicbulletins.sc.edu/archives/2021-2022/undergraduate/engineering-computing/) for progression requirements and special academic opportunities.

Program of Study

<table>
<thead>
<tr>
<th>Requirements</th>
<th>Credit Hours</th>
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</thead>
<tbody>
<tr>
<td>1. Carolina Core</td>
<td>34-46</td>
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<tr>
<td>2. College Requirements</td>
<td>0</td>
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<td>3. Program Requirements</td>
<td>53</td>
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<td>4. Major Requirements</td>
<td>39</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 State 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/archives/2021-2022/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/archives/2021-2022/undergraduate/carolina-core-courses/)

GHS – Global Citizenship and Multicultural Understanding: Historical Thinking (3 hours)

- any CC-GHS course (https://academicbulletins.sc.edu/archives/2021-2022/undergraduate/carolina-core-courses/)

GSS – Global Citizenship and Multicultural Understanding: Social Sciences (3 hours)

- any CC-GSS course (https://academicbulletins.sc.edu/archives/2021-2022/undergraduate/carolina-core-courses/)

AIU – Aesthetic and Interpretive Understanding (3 hours)

- any CC-AIU course (https://academicbulletins.sc.edu/archives/2021-2022/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/archives/2021-2022/undergraduate/carolina-core-courses/)

INF – Information Literacy 1 (0-3 hours)

- any overlay or stand-alone CC-INF course (https://academicbulletins.sc.edu/archives/2021-2022/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/archives/2021-2022/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)

<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>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>
</tbody>
</table>
### Lower Division Engineering

- **STAT 509**  
  Statistics for Engineers  
  **Credits:** 3  

#### Aeroplane Systems

- **AESP 101**  
  Introduction into Aerospace Engineering  
  **Credits:** 3  
- **or ENCP 101**  
  Introduction to Engineering I  
  **Credits:** 3  

#### Introduction to Computer-Aided Design

- **EMCH 111**  
  Introduction to Computer-Aided Design  
  **Credits:** 3  
- **or ENCP 102**  
  Introduction to Engineering II  
  **Credits:** 3  

#### Statics (must be passed with a grade of C or higher)

- **EMCH 200**  
  Statics (must be passed with a grade of C or higher)  
  **Credits:** 3  
- **or ENCP 201**  
  Introduction to Applied Numerical Methods  
  **Credits:** 3  

#### Introduction to Computer-Aided Design II

- **EMCH 201**  
  Introduction to Applied Numerical Methods  
  **Credits:** 3  
- **or ENCP 201**  
  Introduction to Applied Numerical Methods  
  **Credits:** 3  

#### Introduction to the Mechanics of Solids

- **EMCH 260**  
  Introduction to the Mechanics of Solids  
  **Credits:** 3  
- **or ENCP 260**  
  Introduction to the Mechanics of Solids  
  **Credits:** 3  

#### Thermodynamic Fundamentals

- **EMCH 290**  
  Thermodynamics  
  **Credits:** 3  
- **or ENCP 290**  
  Thermodynamic Fundamentals  
  **Credits:** 3  

### Track Electives

Select one of the following tracks:  

#### Aeroplane 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:

### Major Requirements (39 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>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 377</td>
<td>Manufacturing</td>
<td>3</td>
</tr>
<tr>
<td>EMCH 577</td>
<td>Aerospace Structures I</td>
<td>3</td>
</tr>
</tbody>
</table>

**Total Credit Hours**: 39