# AEROSPACE ENGINEERING - BS

## Program Requirements

The freshman year is identical for degrees in aerospace engineering, architectural engineering, civil engineering, computer engineering, computer science, electrical engineering, electronic systems engineering technology, environmental engineering, industrial distribution, industrial engineering, interdisciplinary engineering, manufacturing and mechanical engineering technology, mechanical engineering, multidisciplinary engineering technology, nuclear engineering, ocean engineering, and petroleum engineering (Note: not all programs listed are offered in Qatar). The freshman year is slightly different for chemical engineering, biomedical engineering and materials science and engineering degrees in that students take CHEM 119 or CHEM 107/CHEM 117 and CHEM 120. Students pursuing degrees in biological and agricultural engineering should refer to the specific curriculum for this major. It is recognized that many students will change the sequence and number of courses taken in any semester. Deviations from the prescribed course sequence, however, should be made with care to ensure that prerequisites for all courses are met.

### First Year

<table>
<thead>
<tr>
<th>Semester</th>
<th>Course</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall</td>
<td>CHEM 107</td>
<td>General Chemistry for Engineering Students</td>
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<tr>
<td></td>
<td>CHEM 117</td>
<td>General Chemistry for Engineering Students Laboratory</td>
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<tr>
<td></td>
<td>ENGL 103 or ENGL 104</td>
<td>Introduction to Rhetoric and Composition or Composition and Rhetoric</td>
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<tr>
<td></td>
<td>ENGR 102</td>
<td>Engineering Lab I - Computation</td>
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<tr>
<td></td>
<td>MATH 151</td>
<td>Engineering Mathematics I</td>
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<tr>
<td></td>
<td>University Core Curriculum (<a href="http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/">http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/</a>)</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>Semester Credit Hours</strong></td>
<td><strong>16</strong></td>
</tr>
<tr>
<td>Spring</td>
<td>ENGR 216/PHYS 216</td>
<td>Experimental Physics and Engineering Lab II - Mechanics</td>
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<tr>
<td></td>
<td>MATH 152</td>
<td>Engineering Mathematics II</td>
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<tr>
<td></td>
<td>PHYS 206</td>
<td>Newtonian Mechanics for Engineering and Science</td>
</tr>
<tr>
<td></td>
<td>University Core Curriculum (<a href="http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/">http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/</a>)</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Select one of the following:</td>
<td>3-4</td>
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<tr>
<td></td>
<td>CHEM 120</td>
<td>Fundamentals of Chemistry II</td>
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<tr>
<td></td>
<td>University Core Curriculum (<a href="http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/">http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/</a>)</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>Semester Credit Hours</strong></td>
<td><strong>15-16</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Total Semester Credit Hours</strong></td>
<td><strong>31-32</strong></td>
</tr>
</tbody>
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1 A grade of C or better is required.

2 Entering students will be given a math placement exam. Test results will be used in selecting the appropriate starting course which may be at a higher or lower level.

3 Of the 21 hours shown as University Core Curriculum electives, 3 must be from creative arts (see AREN curriculum for more information), 3 from social and behavioral sciences (see IDIS curriculum for more information), 3 from language, philosophy and culture (see CVEN, EVEN and PETE curriculum for more information), 6 from American history and 6 from government/political science. The required 3 hours of international and cultural diversity and 3 hours of cultural discourse may be met by courses satisfying the creative arts, social and behavioral sciences, language, philosophy and culture, and American history requirements if they are also on the approved list of international and cultural diversity (http://catalog.tamu.edu/undergraduate/general-information/degree-information/international-cultural-diversity-requirements/) courses and cultural discourse (http://catalog.tamu.edu/undergraduate/general-information/degree-information/cultural-discourse-requirements/) courses.

4 BMEN, CHEN and MSEN require 8 hours of fundamentals of chemistry which are satisfied with CHEM 119 or CHEM 107/CHEM 117 and CHEM 120; Students with an interest in BMEN, CHEN and MSEN can take CHEM 120 second semester freshman year. CHEM 120 will substitute for CHEM 107/CHEM 117.

5 For BS-PETE, allocate 3 hours to core communications course (ENG 210, COMM 203, COMM 205, or COMM 243) and/or 3 hours to UCC elective. For BS-MEEN, allocate 3 hours to core communications course (ENG 203, ENG 210, or COMM 205) and/or 3 hours to UCC elective.
### Third Year

#### Fall
- AERO 303 High Speed Aerodynamics 1 3
- AERO 304 Aerospace Structural Analysis I 1 3
- AERO 310 Aerospace Dynamics 1 3
- ECEN 215 Principles of Electrical Engineering 1 3
- University Core Curriculum [Link](http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/) 3

**Semester Credit Hours** 18

#### Spring
- AERO 306 Aerospace Structural Analysis II 1 3
- AERO 307 Aerospace Engineering Laboratory 1 3
- AERO 321 Dynamics of Aerospace Vehicles 1 3
- AERO 351 Aerothermodynamics and Propulsion 1 3
- University Core Curriculum [Link](http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/) 3

**Semester Credit Hours** 15

### Fourth Year

#### Fall
- AERO 401 Aerospace Design Principles 1, 7 3
- AERO 413 Aerospace Materials Science 1 3
- AERO 423 Orbital Mechanics 1 3
- Select one of the following: 1 3
  - AERO 430 Numerical Simulation
  - MATH 401 Advanced Engineering Mathematics
  - MATH 412 Theory of Partial Differential Equations
- Select one of the following: 3
  - AERO 405 Aerospace Structural Design
  - AERO 417 Aerospace Propulsion
  - AERO 419 Chemical Rocket Propulsion
  - AERO 426 Space System Design
  - AERO 428 Electromagnetic Sensing for Space-Borne Imaging
  - AERO 451 Human Spaceflight Operations
  - AERO 472 Airfoil and Wing Design

**Semester Credit Hours** 15

#### Spring
- AERO 402 Aerospace Systems Design 1, 7 2
- AERO 422 Active Controls for Aerospace Vehicles 1 3
- AERO 452 Heat Transfer and Viscous Flows 1 3
- Select two of the following: 6
  - AERO 404 Mechanics of Advanced Aerospace Structures
  - AERO 405 Aerospace Structural Design
  - AERO 411 Applications of Fracture Mechanics to Aerospace Structures
  - AERO 414 Human Performance in Aerospace Environments
  - AERO 415 Computational Fluid Dynamics for Aerospace Applications
  - AERO 417 Aerospace Propulsion

**Semester Credit Hours** 17

**Total Semester Credit Hours** 97

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6 All students are required to complete a high-impact experience in order to graduate. The list of possible high-impact experiences is available in the AERO advising office.

7 A two-semester sequence is required.

**Total Program Hours 128**