## 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 107/117 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>
</tr>
</thead>
<tbody>
<tr>
<td>Fall</td>
<td>CHEM 107 General Chemistry for Engineering Students 1,4 3</td>
</tr>
<tr>
<td></td>
<td>CHEM 117 General Chemistry for Engineering Students Laboratory 1,4 1</td>
</tr>
<tr>
<td></td>
<td>ENGL 103/104 Introduction to Rhetoric and Composition 1 3</td>
</tr>
<tr>
<td></td>
<td>ENGR 102 Engineering Lab I - Computation 1 2</td>
</tr>
<tr>
<td></td>
<td>MATH 151 Engineering Mathematics I 1,2 4</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>) 3 3</td>
</tr>
<tr>
<td>Spring</td>
<td>ENGR 216/217 Experimental Physics and Engineering Lab 2</td>
</tr>
<tr>
<td></td>
<td>PHYS 216 II - Mechanics 1 2</td>
</tr>
<tr>
<td></td>
<td>MATH 152 Engineering Mathematics II 1 4</td>
</tr>
<tr>
<td></td>
<td>PHYS 206 Newtonian Mechanics for Engineering and Science 1 3</td>
</tr>
</tbody>
</table>

### Second Year

<table>
<thead>
<tr>
<th>Semester</th>
<th>Course</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall</td>
<td>AERO 201 Introduction to Flight 1 3</td>
</tr>
<tr>
<td></td>
<td>AERO 211 Aerospace Engineering Mechanics 1 3</td>
</tr>
<tr>
<td></td>
<td>AERO 212 Introduction to Aerothermodynamics 1 3</td>
</tr>
<tr>
<td></td>
<td>AERO 221 Analytical Methods for Aerospace Engineering 1 3</td>
</tr>
<tr>
<td></td>
<td>MATH 251 or MATH 253 Engineering Mathematics III 1 3</td>
</tr>
<tr>
<td>Spring</td>
<td>AERO 214 Introduction to Aerospace Mechanics of Materials 1 3</td>
</tr>
<tr>
<td></td>
<td>AERO 222 Introduction to Aerospace Computation 1 3</td>
</tr>
<tr>
<td></td>
<td>AERO 301 Theoretical Aerodynamics 1 3</td>
</tr>
</tbody>
</table>

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 107/117 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 107/117.
5 For BS-PETE, allocate 3 hours to core communications course (ENGL 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 (ENGL 203, ENGL 210, or COMM 205) and/or 3 hours to UCC elective.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Semester Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 308</td>
<td>Differential Equations</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 207</td>
<td>Electricity and Magnetism for Engineering and Science</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 217</td>
<td>Experimental Physics and Engineering Lab</td>
<td>2</td>
</tr>
<tr>
<td>ENGR 217</td>
<td>III - Electricity and Magnetism</td>
<td>2</td>
</tr>
<tr>
<td>High Impact Experience</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>AERO 299</td>
<td>Mid-Curriculum Professional Development</td>
<td>0</td>
</tr>
</tbody>
</table>

### Semester Credit Hours

**Third Year**

#### Fall
- AERO 303 High Speed Aerodynamics | 3
- AERO 304 Aerospace Structural Analysis I | 3
- AERO 310 Aerospace Dynamics | 3
- ECEN 215 Principles of Electrical Engineering | 3
- Select one of the following: | 3
  - ENGL 210 Technical and Professional Writing
  - COMM 203 Public Speaking
  - COMM 205 Communication for Technical Professions
  - COMM 243 Argumentation and Debate

University Core Curriculum (http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/) | 3

**Semester Credit Hours** | 18

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

**Semester Credit Hours** | 15

### Fourth Year

#### Fall
- AERO 401 Aerospace Design Principles | 3
- AERO 413 Aerospace Materials Science | 3
- AERO 423 Orbital Mechanics | 3
- Select one of the following: | 3
  - AERO 404 Mechanics of Advanced Aerospace Structures
  - 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 472 Airfoil and Wing Design

University Core Curriculum (http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/) | 3

**Semester Credit Hours** | 15

#### Spring
- AERO 402 Aerospace Systems Design | 2
- AERO 422 Active Controls for Aerospace Vehicles | 3
- AERO 452 Heat Transfer and Viscous Flows | 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
  - AERO 419 Chemical Rocket Propulsion
  - AERO 420 Aerelasticity
  - AERO 424 Spacecraft Attitude Dynamics and Control
  - AERO 425 Flight Test Engineering
  - AERO 426 Space System Design
  - AERO 428 Electromagnetic Sensing for Space-Borne Imaging
  - AERO 430 Numerical Simulation
  - AERO 435 Aerothermodynamics
  - AERO 436/ISEN 432 Human Factors Engineering for Aerospace Designs
  - AERO 440 Cockpit Systems and Displays
  - AERO 445 Vehicle Management Systems
  - AERO 451 Human Spaceflight Operations
  - AERO 455 Helicopter Aerodynamics
  - AERO 472 Airfoil and Wing Design
  - AERO 478 Low Temperature Plasma - Theory, Modeling, Applications
  - AERO 489 Special Topics in...

University Core Curriculum (http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/) | 3

**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**