Aerospace Engineering - BS

Coursework in aerodynamics, materials and structures, propulsion, and dynamics and control of aircraft and spacecraft provide a strong fundamental basis for advanced study and specialization, while senior technical electives offer a concentration of study in fields of special interest. Design is emphasized particularly in senior design electives and a senior-level two-semester design sequence involving specific goals, objectives, and constraints, which integrates analysis and design tools and requires students working in teams to design, and in some cases build, test, and deploy an aerospace system, such as an aircraft, rotorcraft, flight simulator, morphing air or space structure, space suit, space habitat, or a mission to Mars. Application of modern engineering and computational tools is required and emphasized in most courses.

Program Requirements

The freshman year is identical for degrees in aerospace engineering, architectural engineering, civil engineering, computer engineering, computer science, data engineering, electrical engineering, 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 (http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/) for more information.

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 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/international-cultural-diversity-requirements/) courses and cultural discourse (http://catalog.tamu.edu/undergraduate/general-information/cultural-discourse-requirements/) courses.

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 (http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/) courses.

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, ENGL 210, or COMM 205) and/or 3 hours to UCC elective.

### First Year

#### Fall

<table>
<thead>
<tr>
<th>Course</th>
<th>Description</th>
<th>Semester Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 107</td>
<td>General Chemistry for Engineering Students</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 117</td>
<td>General Chemistry for Engineering students</td>
<td>1</td>
</tr>
<tr>
<td>ENGL 103 or ENGL 104</td>
<td>Introduction to Rhetoric and Composition</td>
<td>3</td>
</tr>
<tr>
<td>ENGR 102</td>
<td>Engineering Lab I - Computation</td>
<td>2</td>
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<tr>
<td>MATH 151</td>
<td>Engineering Mathematics I</td>
<td>4</td>
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<tr>
<td>University Core Curriculum</td>
<td>(<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>
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### Spring

<table>
<thead>
<tr>
<th>Course</th>
<th>Description</th>
<th>Semester Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGR 216/PHYS 216/MATH 152</td>
<td>Experimental Physics and Engineering Lab II - Mechanics</td>
<td>2</td>
</tr>
<tr>
<td>PHYS 206</td>
<td>Newtonian Mechanics for Engineering and Science</td>
<td>3</td>
</tr>
</tbody>
</table>

### Second Year

#### Fall

<table>
<thead>
<tr>
<th>Course</th>
<th>Description</th>
<th>Semester Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>AERO 201</td>
<td>Introduction to Flight</td>
<td>3</td>
</tr>
<tr>
<td>AERO 211</td>
<td>Aerospace Engineering Mechanics</td>
<td>3</td>
</tr>
<tr>
<td>AERO 212</td>
<td>Introduction to Aerothermodynamics</td>
<td>3</td>
</tr>
<tr>
<td>AERO 221</td>
<td>Analytical Methods for Aerospace Engineering</td>
<td>3</td>
</tr>
<tr>
<td>MATH 251 or MATH 253</td>
<td>Engineering Mathematics III or Engineering Mathematics III</td>
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</tr>
</tbody>
</table>

### Spring

<table>
<thead>
<tr>
<th>Course</th>
<th>Description</th>
<th>Semester Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>AERO 214</td>
<td>Introduction to Aerospace Mechanics of Materials</td>
<td>3</td>
</tr>
<tr>
<td>AERO 222</td>
<td>Introduction to Aerospace Computation</td>
<td>3</td>
</tr>
<tr>
<td>AERO 301</td>
<td>Theoretical Aerodynamics</td>
<td>3</td>
</tr>
</tbody>
</table>
Aerospace Engineering - BS

### Third Year

#### Fall
- **AERO 303** High Speed Aerodynamics  
- **AERO 304** Aerospace Structural Analysis I  
- **AERO 310** Aerospace Dynamics  
- **ECEN 215** Principles of Electrical Engineering  

Select one of the following:
- **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/)  

#### Semester Credit Hours
18

#### Spring
- **AERO 306** Aerospace Structural Analysis II  
- **AERO 307** Aerospace Engineering Laboratory  
- **AERO 321** Dynamics of Aerospace Vehicles  
- **AERO 351** Aerothermodynamics and Propulsion  

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

#### Semester Credit Hours
15

### Fourth Year

#### Fall
- **AERO 401** Aerospace Design Principles  
- **AERO 413** Aerospace Materials Science  
- **AERO 423** Orbital Mechanics  

Select one of the following:
- **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/)  

#### Semester Credit Hours
17

#### Total Semester Credit Hours
97

### Total Program Hours 128

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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.