ARCHITECTURAL ENGINEERING - BS, MECHANICAL SYSTEMS FOR BUILDINGS TRACK

The BS in Architectural Engineering degree prepares graduates for professional engineering careers within the architectural, engineering and construction industry. Specifically, it prepares them to become licensed professional engineers, achieve leadership positions in consulting firms, suppliers or government agencies, as well as successfully complete graduate studies in engineering or other areas. The Mechanical Building Systems Track to fulfill the BS in Architectural Engineering degree prepares students for careers with more emphasis on energy efficiency, HVAC (Heating, Ventilation, and Air-Conditioning), building environmental controls, and building environment. The focus electives prepare students to design and analyze mechanical systems for buildings.

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 Code</th>
<th>Course Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall</td>
<td>CHEM 107</td>
<td>General Chemistry for Engineering Students</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>CHEM 117</td>
<td>General Chemistry for Engineering Students Laboratory</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>ENGL 103 or ENGL 104</td>
<td>Introduction to Rhetoric and Composition or Composition and Rhetoric</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>ENGR 102</td>
<td>Engineering Lab I - Computation</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>MATH 151</td>
<td>Engineering Mathematics I</td>
<td>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>)</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>MATH 152</td>
<td>Engineering Mathematics II</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>PHYS 206</td>
<td>Newtonian Mechanics for Engineering and Science</td>
<td>3</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></td>
<td>3</td>
</tr>
</tbody>
</table>

Select one of the following:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 120</td>
<td>Fundamentals of Chemistry II</td>
<td>3-4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Semester Credit Hours</th>
<th>15-16</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Semester Credit Hours</td>
<td>31-32</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/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 (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.

Second Year

<table>
<thead>
<tr>
<th>Semester</th>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall</td>
<td>AREN 200</td>
<td>Architectural Engineering Foundations</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>AREN 210</td>
<td>Fundamentals of Building Information Modeling for Architectural Engineering</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>ENGR 217/PHYS 217</td>
<td>Experimental Physics and Engineering Lab III - Electricity and Magnetism</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>MATH 251 or MATH 253</td>
<td>Engineering Mathematics III or Engineering Mathematics III</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>MEEN 221</td>
<td>Statics and Particle Dynamics</td>
<td>3</td>
</tr>
</tbody>
</table>

1. 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.
2. 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.
PHYS 207  Electricity and Magnetism for Engineering and Science  3

Semester Credit Hours 16

Spring
AREN 300  Architectural Engineering Systems  3
CVEN 305  Mechanics of Materials  3
ECEN 215  Principles of Electrical Engineering  3
MATH 308  Differential Equations  3
MEEN 315  Principles of Thermodynamics  3
Select one of the following:  3
COMM 203  Public Speaking
COMM 205  Communication for Technical Professions
COMM 243  Argumentation and Debate
ENGL 203  Writing about Literature
ENGL 210  Technical and Professional Writing

Semester Credit Hours 18

Summer
High Impact Experience  7
AREN 399  High Impact Experience for Architectural Engineers

Semester Credit Hours 0

Third Year
Fall
AREN 320  Lighting Engineering for Buildings  3
AREN 330  Mechanical Systems for Buildings  3
CVEN 302  Computer Applications in Engineering and Construction  3
MEEN 344  Fluid Mechanics  3
Math/Science elective  1, 8
University Core Curriculum (http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/)  3

Semester Credit Hours 15

Spring
AREN 440  Architectural Engineering Heating, Ventilating and Air Conditioning Design  3
CVEN 345  Theory of Structures  3
COSC 333  Project Management for Facility Managers  3
MEEN 461  Heat Transfer  3
Select one of the following:  3
ARCH 249  Survey of World Architecture History I
ARCH 250  Survey of World Architecture History II
ARCH 350  History and Theory of Modern and Contemporary Architecture

Semester Credit Hours 15

Fourth Year
Fall
AREN 401  Architectural Engineering Design I  3
MEEN 437  Principles of Building Energy Analysis  3
Technical elective I  3
Technical elective II  3

A grade of C or better is required in all science, mathematics, and engineering courses taken to satisfy degree requirements.

This curriculum lists the minimum number of classes required for graduation. Additional courses may be taken.

Total Program Hours 128