**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 and biomedical engineering and materials science and engineering degrees (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 and biomedical engineering and materials science and engineering degrees (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 and biomedical engineering and materials science and engineering degrees (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 and biomedical engineering and materials science and engineering degrees (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 and biomedical engineering and materials science and engineering degrees (Note: not all programs listed are offered in Qatar).

**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>Fall</td>
<td>CHEM 117</td>
<td>General Chemistry for Engineering Students Laboratory</td>
<td>1</td>
</tr>
<tr>
<td>Fall</td>
<td>ENGL 103</td>
<td>Introduction to Rhetoric and Composition</td>
<td>3</td>
</tr>
<tr>
<td>Fall</td>
<td>ENGR 102</td>
<td>Engineering Lab I - Computation</td>
<td>2</td>
</tr>
<tr>
<td>Fall</td>
<td>MATH 151</td>
<td>Engineering Mathematics I</td>
<td>4</td>
</tr>
<tr>
<td>Fall</td>
<td>University Core Curriculum</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Spring</td>
<td>ENGR 216/PHYS 216</td>
<td>Experimental Physics and Engineering Lab II-Mechanics</td>
<td>2</td>
</tr>
</tbody>
</table>

**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>Fall</td>
<td>AREN 210</td>
<td>Fundamentals of Building Information Modeling for Architectural Engineering</td>
<td>3</td>
</tr>
<tr>
<td>Fall</td>
<td>ENGR 217/PHYS 217</td>
<td>Experimental Physics and Engineering Lab III-Electricity and Magnetism</td>
<td>2</td>
</tr>
<tr>
<td>Fall</td>
<td>MATH 251/PHYS 253</td>
<td>Engineering Mathematics III or Engineering Mathematics III</td>
<td>3</td>
</tr>
<tr>
<td>Fall</td>
<td>MEEN 221</td>
<td>Statics and Particle Dynamics</td>
<td>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 (see [TAMU catalog](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.
PHYS 207 Electricity and Magnetism for Engineering and Science 1 3

| Semester Credit Hours | 16 |

**Spring**
AREN 300 Architectural Engineering Systems 1 3
CVEN 305 Mechanics of Materials 1 3
ECEN 215 Principles of Electrical Engineering 1 3
MATH 308 Differential Equations 1 3
MEEN 315 Principles of Thermodynamics 1 3
Select one of the following:
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 1 3
AREN 330 Mechanical Systems for Buildings 1 3
CVEN 302 Computer Applications in Engineering and Construction 1 3
MEEN 344 Fluid Mechanics 1 3
Math/Science elective 1, 8 3
University Core Curriculum (http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/) 3 3

| Semester Credit Hours | 18 |

**Spring**
AREN 440 Architectural Engineering Heating, Ventilating and Air Conditioning Design 1 3
CVEN 345 Theory of Structures 1 3
COSC 333 Project Management for Facility Managers 1 3
MEEN 461 Heat Transfer 1 3
Select one of the following: 9
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 1, 6 3
MEEN 437 Principles of Building Energy Analysis 1 3
Technical elective I 1, 10 3
Technical elective II 1, 11 3

| Semester Credit Hours | 15 |

**Total Semester Credit Hours** 97

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

| Semester Credit Hours | 15 |

**Fourth Year**

**Spring**
AREN 402 Architectural Engineering Design II 1 3
CVEN 446 Structural Steel Design 1 3
Technical elective III 1, 11 3
Technical elective IV 1, 11 3
University Core Curriculum (http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/) 3 3

| Semester Credit Hours | 15 |

**Total Program Hours** 128

6 All students must take at least two courses in their major that are designated as writing intensive (W) or one writing intensive and one communications intensive (C) course. AREN 200 and AREN 401 taken at Texas A&M University satisfy this requirement. A grade of C or better is required in these courses.
7 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 AREN advising office.
8 Select from ATMO 363; BIOL 111, BIOL 113; CHEM 222; ECCB 205, GEG 205, GEOL 101, GEOL 104; MATH 304, MATH 311, MATH 323, MATH 401; PHYS 222; RWFM 375; STAT 211, STAT 414.
9 The three available architectural history electives all satisfy the University Core Curriculum requirements for creative arts and international and cultural diversity.
10 Select from ARCH 328, ARCH 335, ARCH 421; COSC 253, COSC 325, COSC 326, COSC 461; CVEN 306, CVEN 342.
11 Select from MEEN 421, MEEN 436, MEEN 439, MEEN 463, MEEN 469, MEEN 477.

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.