# CIVIL ENGINEERING - BS, ENVIRONMENTAL ENGINEERING TRACK

The Environmental Engineering Track to fulfill the BS in Civil Engineering degree emphasizes specialized coursework in water and waste water treatment, air and water quality management, solid and hazardous wastes, ground water protection and remediation, and environmental policy. This track is appropriate for those wishing to pursue careers in protecting the natural environment from human activities, protecting human populations from the effects of adverse environmental factors, and improving the environmental quality for human health and well-being.

## 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**

| Fall | | Semester Credit Hours |
|---|---|---|
| CHEM 107 | General Chemistry for Engineering Students [1,4] | 3 |
| CHEM 117 | General Chemistry for Engineering Students Laboratory [1,4] | 1 |
| ENGL 103 or ENGL 104 | Introduction to Rhetoric and Composition [1] or Composition and Rhetoric | 3 |
| ENGR 102 | Engineering Lab I - Computation [1] | 2 |
| MATH 151 | Engineering Mathematics I [1,2] | 4 |
| University Core Curriculum (http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/) [3] | | 3 |
| | **Semester Credit Hours** | **16** |
| **Spring** | | |
| ENGR 216/ PHYS 216 | Experimental Physics and Engineering Lab II - Mechanics [1] | 2 |
| MATH 152 | Engineering Mathematics II [1] | 4 |
| PHYS 206 | Newtonian Mechanics for Engineering and Science [1] | 3 |
| University Core Curriculum (http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/) [3] | | 3 |
| Select one of the following: | | 3-4 |
| CHEM 120 | Fundamentals of Chemistry II [1,4] | |
| University Core Curriculum (http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/) [3,5] | | |
| | **Semester Credit Hours** | **15-16** |
| | **Total Semester Credit Hours** | **31-32** |

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**

| Fall | | Semester Credit Hours |
|---|---|---|
| CVEN 207 | Introduction to the Civil Engineering Profession | 2 |
| CVEN 221 | Engineering Mechanics: Statics | 3 |
| CVEN 250 | Introduction to Graphics and Visualization Applications in Civil Engineering Design | 2 |
| ENGR 217/ PHYS 217 | Experimental Physics and Engineering Lab III - Electricity and Magnetism | 2 |
| MATH 251 | Engineering Mathematics III | 3 |
| PHYS 207 | Electricity and Magnetism for Engineering and Science | 3 |
| STAT 211 | Principles of Statistics I | 3 |
| | **Semester Credit Hours** | **18** |

| | | |
|---|---|---|
| **Spring** | | |
| CVEN 302 | Computer Applications in Engineering and Construction | 3 |
| CVEN 303 | Civil Engineering Measurement | 3 |
| CVEN 305 | Mechanics of Materials | 3 |
| CVEN 311/ EVEN 311 | Fluid Dynamics | 3 |
| ENGL 210 or COMM 205 | Technical and Professional Writing or Communication for Technical Professions | 3 |
| MATH 308 | Differential Equations | 3 |
| | **Semester Credit Hours** | **18** |
| **Third Year** | | |
| **Fall** | | |
| CVEN 306 | Materials Engineering for Civil Engineers | 3 |
| CVEN 322 | Civil Engineering Systems | 3 |
| CVEN 345 | Theory of Structures | 3 |
| CVEN 363 | Engineering Mechanics: Dynamics | 3 |
| Technical coursework [6] | | 3 |
| | **Semester Credit Hours** | **15** |
| **Spring** | | |
| CVEN 399 | Mid-Curriculum Professional Development | 0 |
| Technical coursework [6] | | 12 |
| University Core Curriculum (http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/) [3] | | 3 |
| | **Semester Credit Hours** | **15** |
| **Fourth Year** | | |
| **Fall** | | |
| CVEN 424 | Civil Engineering Professional Practice [7] | 2 |
| Technical coursework [6] | | 11 |
| University Core Curriculum (http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/) [3] | | 3 |
| | **Semester Credit Hours** | **16** |
| **Spring** | | |
| PHIL 482/ ENGR 482 | Ethics and Engineering | 3 |
| Technical coursework [6] | | 9 |
| University Core Curriculum (http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/) [3] | | 3 |
| | **Semester Credit Hours** | **15** |
| | **Total Semester Credit Hours** | **97** |

[6] A total of 35 hours of technical coursework is required. Technical coursework is divided into five categories: breadth courses, design courses, focus courses, a science course, and a capstone design course. The total number of hours between breadth, design, and focus courses must add up to 29 hours. The choice of courses to be taken in each of the five categories depends on the track chosen and must be made in consultation with the student's advisor and/or the Civil and Environmental Engineering Undergraduate Student Services Office to ensure pre- and co-requisites are satisfied. Capstone design courses must include more than one civil engineering context.

[7] All students must take at least two courses in their major that are designated as writing intensive (W). CVEN 207 and CVEN 424 taken at Texas A&M satisfy this requirement. Other CVEN courses may be approved as W courses at a later date. A grade of C or better is required in these courses.

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

# Total Program Hours 128

# Environmental Engineering Track - Technical Coursework

Technical coursework for the BS in Civil Engineering, Environmental Engineering Track are composed of breadth courses (10-12 semester credit hours), design courses (6-15 semester credit hours), focus courses (2-13 semester credit hours), a science course (3 semester credit hours), and a capstone design course (3 semester credit hours), as delineated below, for a total of 35 semester credit semester credit hours. A substitution for any course in the track must be approved in writing by the Civil and Environmental Engineering Undergraduate Student Services Office.

| Code | Title | Semester Credit Hours |
|---|---|---|
| **BREADTH** | | |
| CVEN 301/ EVEN 301 | Environmental Engineering | 3 |
| CVEN 339/ EVEN 339 | Water Resources Engineering | 3 |
| Select from the following: | | 4-6 |
| CVEN 304/ EVEN 304 | Environmental Engineering Lab [1] | |
| CVEN 336 | Fluid Dynamics Laboratory [1] | |
| CVEN 342 | Materials of Construction [1] | |
| or CVEN 343 | or Portland Cement Concrete Materials for Civil Engineers | |
| CVEN 365 | Introduction to Geotechnical Engineering [1] | |
| EVEN 404 | Environmental Unit Operations Laboratory [1] | |
| **DESIGN** | | |
| CVEN 402/ EVEN 402 | Engineered Environmental Systems | 3 |
| Select from the following: | | 3-12 |
| CVEN 455 | Urban Stormwater Management | |
| CVEN 458/ EVEN 458 | Hydraulic Engineering of Water Distribution Systems | |
| CVEN 462/ EVEN 462 | Engineering Hydrogeology | |
| CVEN 465 | Coastal Resilience | |
| **FOCUS** | | |
| Select from the following: | | 2-13 |
| CVEN 314 | Sensor Technology in Civil Engineering | |

| | | |
|---|---|---|
| or CVEN 316 | or Sensor Technology for the Built Environment | |
| CVEN 406/ EVEN 406 | Environmental Protection and Public Health | |
| CVEN 413/ EVEN 413 | Natural Environmental Systems | |
| CVEN 423 | Geomatics for Civil Engineering | |
| CVEN 450 | AutoCAD in Civil Engineering | |
| CVEN 463/ EVEN 463 | Engineering Hydrology | |
| CVEN 464 | Environmental Fluid Mechanics | |
| CVEN 485 | Directed Studies [2] | |
| CVEN 491 | Research [2] | |
| EVEN 466 | Sustainability and Life Cycle Analysis | |
| BAEN 320 | Engineering Thermodynamics | |
| or MEEN 315 | or Principles of Thermodynamics | |
| **SCIENCE** | | |
| Select from the following: | | 3 |
| ATMO 201 | Weather and Climate | |
| ATMO 363 | Introduction to Atmospheric Chemistry and Air Pollution | |
| BESC 201 | Introduction to Bioenvironmental Sciences | |
| BIOL 113 | Essentials in Biology | |
| ECCB 205 | Fundamentals of Ecology | |
| GEOG 203 | Planet Earth | |
| GEOL 104 | Physical Geology | |
| GEOL 320 | Geology for Civil Engineers | |
| GEOS 105 | Introduction to Environmental Geoscience | |
| OCNG 310 | Physical Oceanography | |
| RWFM 375 | Conservation of Natural Resources | |
| **CAPSTONE DESIGN** | | |
| CVEN 400 | Design Problems in Civil Engineering | 3 |
| **Total Semester Credit Hours** | | **35** |

[1] The following courses satisfy the laboratory course requirement, CVEN 304/EVEN 304, CVEN 336, CVEN 342 or CVEN 343, CVEN 365, EVEN 404.

[2] Up to 2 hours of CVEN 485 or CVEN 491 may be used.