CIVIL ENGINEERING - BS, STRUCTURAL ENGINEERING TRACK

The Structural Engineering track to fulfill the BS in Civil Engineering degree provides coursework in the areas of structural analysis and structural design that equip the student to analyze and design the frameworks that support buildings, bridges, offshore installations, and civil infrastructure projects. This track is appropriate for careers related to the structural design of engineered facilities to safely resist the forces found in their environment, and for those planning on further specialization in graduate studies.

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

Structural Engineering Track - Technical Coursework

Technical coursework for the BS in Civil Engineering, Structural Engineering Track are composed of breadth courses (12-15 semester credit hours), design courses (9-12 semester credit hours), focus courses (5-8 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 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 349	Civil Engineering Project Management	3
CVEN 342 or CVEN 343	Materials of Construction [1] or Portland Cement Concrete Materials for Civil Engineers	3
CVEN 365	Introduction to Geotechnical Engineering [1]	3
Select 3-6 hours from the following:		3-6
CVEN 301/ EVEN 301	Environmental Engineering	
CVEN 307	Transportation Engineering	
CVEN 339/ EVEN 339	Water Resources Engineering	
DESIGN		
CVEN 444	Structural Concrete Design	3
CVEN 446	Structural Steel Design	3
Select 3-6 hours from the following:		3-6
CVEN 435	Geotechnical Engineering Design	
CVEN 473	Engineering Project Estimating and Planning	
FOCUS		
CVEN 445	Matrix Methods of Structural Analysis	3
Select 2 hours from the following:		2
CVEN 314	Sensor Technology in Civil Engineering [2]	
CVEN 336	Fluid Dynamics Laboratory	
CVEN 403	Applied Civil Engineering Surveying	

CVEN 449	Visualization and Building Information Modeling in Structural Engineering Design	
CVEN 450	AutoCAD in Civil Engineering	
CVEN 485	Directed Studies [3]	
CVEN 491	Research [3]	
Select 0-3 hours from the following:		0-3
CVEN 315	Sensor Technology for the Built Environment [2]	
CVEN 405	Construction Management of Field Operations	
CVEN 423	Geomatics for Civil Engineering	
CVEN 436	Case Histories in Geotechnical Engineering	
CVEN 451	Public Works Engineering	
MATH 304	Linear Algebra	
MATH 311	Topics in Applied Mathematics I	
STAT 212	Principles of Statistics II	
SCIENCE		
Select 3 hours 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 483	Analysis and Design of Structures	3
Total Semester Credit Hours		**35**

[1] The following courses satisfy the laboratory course requirement, CVEN 342 or CVEN 343, CVEN 365.

[2] Only one of the following courses, CVEN 314 or CVEN 315, can be used to meet the focus elective.

[3] Up to 2 hours of CVEN 485 or CVEN 491 may be used. A proposal must be submitted to the undergraduate office and approved before credit can be awarded towards the degree.