

# CIVIL ENGINEERING - BS, GENERAL CIVIL ENGINEERING TRACK

The General Civil Engineering Track to fulfill the BS in Civil Engineering degree emphasizes breadth across the civil engineering field. Students take courses in all major sub-disciplines of civil engineering with advanced design and focus electives allowing deeper learning in selected areas. The track is appropriate for a career in any area of civil engineering, with particular relevance for those interested in public works, land development, and general civil, 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 <sup>1,4</sup>	3
CHEM 117	General Chemistry for Engineering Students Laboratory <sup>1,4</sup>	1
ENGL 103 or ENGL 104	Introduction to Rhetoric and Composition <sup>1</sup> or Composition and Rhetoric	3
ENGR 102	Engineering Lab I - Computation <sup>1</sup>	2
MATH 151	Engineering Mathematics I <sup>1,2</sup>	4
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> ) <sup>3</sup>		3
<b>Semester Credit Hours</b>		<b>16</b>

### Spring

ENGR 216/ PHYS 216	Experimental Physics and Engineering Lab II - Mechanics <sup>1</sup>	2
MATH 152	Engineering Mathematics II <sup>1</sup>	4
PHYS 206	Newtonian Mechanics for Engineering and Science <sup>1</sup>	3

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

Select one of the following: 3-4

CHEM 120 Fundamentals of Chemistry II<sup>1,4</sup>

University Core Curriculum (<http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/>)<sup>3,5</sup>

**Semester Credit Hours 15-16**

**Total Semester Credit Hours 31-32**

<sup>1</sup> A grade of C or better is required.

<sup>2</sup> 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.

<sup>3</sup> 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.

<sup>4</sup> 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.

<sup>5</sup> 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
<b>Semester Credit Hours</b>		<b>18</b>

**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
<b>Semester Credit Hours</b>		<b>18</b>

**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 <sup>6</sup>		3
<b>Semester Credit Hours</b>		<b>15</b>

**Spring**

CVEN 399	Mid-Curriculum Professional Development	0
Technical coursework <sup>6</sup>		12
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> ) <sup>3</sup>		3
<b>Semester Credit Hours</b>		<b>15</b>

**Fourth Year****Fall**

CVEN 424	Civil Engineering Professional Practice <sup>7</sup>	2
Technical coursework <sup>6</sup>		11
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> ) <sup>3</sup>		3
<b>Semester Credit Hours</b>		<b>16</b>

**Spring**

PHIL 482/ ENGR 482	Ethics and Engineering	3
Technical coursework <sup>6</sup>		9
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> ) <sup>3</sup>		3
<b>Semester Credit Hours</b>		<b>15</b>
<b>Total Semester Credit Hours</b>		<b>97</b>

<sup>6</sup> 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.

<sup>7</sup> 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

### General Civil Engineering Track - Technical Coursework

Technical coursework for the BS in Civil Engineering, General Civil Engineering Track are composed of breadth courses (18 semester credit hours), design courses (6-9 semester credit hours), focus courses (2-5 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
<b>BREADTH</b>		
CVEN 301/ EVEN 301	Environmental Engineering	3
CVEN 307	Transportation Engineering	3
CVEN 339/ EVEN 339	Water Resources Engineering	3
CVEN 342	Materials of Construction <sup>1</sup>	3
	or CVEN 343 or Portland Cement Concrete Materials for Civil Engineers	
CVEN 349	Civil Engineering Project Management	3
CVEN 365	Introduction to Geotechnical Engineering <sup>1</sup>	3
<b>DESIGN</b>		
CVEN 444	Structural Concrete Design	3
Select 3-6 hours from the following:		3-6
CVEN 402/ EVEN 402	Engineered Environmental Systems	
CVEN 418	Highway Materials and Pavement Design	
CVEN 435	Geotechnical Engineering Design	
CVEN 455	Urban Stormwater Management	
CVEN 457	Urban Traffic Facilities	
CVEN 458/ EVEN 458	Hydraulic Engineering of Water Distribution Systems	
CVEN 462/ EVEN 462	Engineering Hydrogeology	
CVEN 465	Coastal Resilience	
CVEN 473	Engineering Project Estimating and Planning	
Select 0-3 hours from the following:		0-3
CVEN 446	Structural Steel Design	

**FOCUS**

Select 2 hours from the following: 2

CVEN 314 Sensor Technology in Civil Engineering<sup>2</sup>

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<sup>3</sup>CVEN 491 Research<sup>3</sup>

Select 0-3 hours from the following: 0-3

CVEN 315 Sensor Technology for the Built Environment<sup>2</sup>

CVEN 405 Construction Management of Field Operations

CVEN 406/ Environmental Protection and  
EVEN 406 Public HealthCVEN 413/ Natural Environmental Systems  
EVEN 413

CVEN 417 Bituminous Materials

CVEN 423 Geomatics for Civil Engineering

CVEN 445 Matrix Methods of Structural Analysis

CVEN 451 Public Works Engineering

CVEN 454 Urban Planning for Engineers

CVEN 463/ Engineering Hydrology  
EVEN 463**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

RWF 375 Conservation of Natural Resources

**CAPSTONE DESIGN**

CVEN 400 Design Problems in Civil Engineering 3

or CVEN 48: or Analysis and Design of Structures

**Total Semester Credit Hours 35**<sup>2</sup> Only one of the following courses, CVEN 314 or CVEN 315, can be used to meet the focus elective.<sup>3</sup> 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.<sup>1</sup> The following courses satisfy the laboratory course requirement, CVEN 342 or CVEN 343, CVEN 365.