STRUCTURAL DESIGN AND CONSTRUCTION ENGINEERING TECHNOLOGY, B.S.

Begin Campus: Any Penn State Campus

End Campus: Harrisburg

Program Description

Not all options are available at every campus. Contact the campus you are interested in attending to determine which options are offered.

The program in Structural Design and Construction Engineering Technology provides the basic education required for the structural engineer and construction profession. Students learn the basic general engineering concepts needed for this major with emphasis on the fundamentals, structural design principles, and construction techniques through required course work. They are given the opportunity to focus in a discipline of construction management or structural design through a selected option or choose a broad general option. Courses in communication skills, arts, humanities, social and behavioral sciences, and other engineering related areas broaden the program. Students gain experience in working as members of a team and in using interdisciplinary approaches to solve problems. These experiences, as well as those related to design and construction principles, are taught through exercises in the classroom, laboratory, and field. The program culminates with a capstone project course in which the students' knowledge and skills are applied to specific problems.

What is Structural Design and Construction Engineering Technology?

Structural Design and Construction Engineering Technology is a discipline concerned with basic structural engineering principles and construction techniques, building site inspection, site supervision, construction personnel supervision, plan and specification interpretation, supply logistics and procurement, applicable building codes, and report preparation.

You Might Like This Program If...

- You like hands-on and creative problem-solving.
- You work well within collaborative, multidisciplinary teams.
- You are interested in a career in the construction industry.

Entrance to Major

In order to be eligible for entrance to this major, a student must:

1. attain at least a C (2.00) cumulative grade-point average for all courses taken at the University; and
2. have third-semester classification (http://www.registrar.psu.edu/registration/semester_classification.cfm).

READ SENATE POLICY 37-30: ENTRANCE TO AND CHANGES IN MAJOR PROGRAMS OF STUDY (http://senate.psu.edu/policies-and-rules-for-undergraduate-students/37-00-entrance-to-a-college-or-major)

Degree Requirements

For the Bachelor of Science degree in Structural Design and Construction Engineering Technology, a minimum of 125 credits is required:

Requirement	Credits
General Education	45
Electives	2-10
Requirements for the Major	95-102

General Education

Connecting career and curiosity, the General Education curriculum provides the opportunity for students to acquire transferable skills necessary to be successful in the future and to thrive while living in interconnected contexts. General Education aids students in developing intellectual curiosity, a strengthened ability to think, and a deeper sense of aesthetic appreciation. These are requirements for all baccalaureate students and are often partially incorporated into the requirements of a program. For additional information, see the General Education Requirements (http://bulletins.psu.edu/undergraduate/general-education/baccalaureate-degree-general-education-program) section of the Bulletin and consult your academic adviser.

The keystone symbol appears next to the title of any course that is designated as a General Education course. Program requirements may also satisfy General Education requirements and vary for each program.

Foundations (grade of C or better is required.)

- **Quantification (GQ):** 6 credits
- **Writing and Speaking (GWS):** 9 credits

Knowledge Domains

- **Arts (GA):** 6 credits
- **Health and Wellness (GHW):** 3 credits
- **Humanities (GH):** 6 credits
- **Social and Behavioral Sciences (GS):** 6 credits
- **Natural Sciences (GN):** 9 credits

Integrative Studies (may also complete a Knowledge Domain requirement)

- **Inter-Domain or Approved Linked Courses:** 6 credits

20-24 of these 45 credits are included in the Requirements for the Major.

University Degree Requirements

First Year Engagement

All students enrolled in a college or the Division of Undergraduate Studies at University Park, and the World Campus are required to take 1 to 3 credits of the First-Year Seminar, as specified by their college First-Year Engagement Plan.

Other Penn State colleges and campuses may require the First-Year Seminar; colleges and campuses that do not require a First-Year Seminar provide students with a first-year engagement experience.

First-year baccalaureate students entering Penn State should consult their academic adviser for these requirements.

Cultures Requirement

6 credits are required and may satisfy other requirements

- United States Cultures: 3 credits
- International Cultures: 3 credits

Writing Across the Curriculum
3 credits required from the college of graduation and likely prescribed as part of major requirements.

Total Minimum Credits
A minimum of 120 degree credits must be earned for a baccalaureate degree. The requirements for some programs may exceed 120 credits. Students should consult with their college or department adviser for information on specific credit requirements.

Quality of Work
Candidates must complete the degree requirements for their major and earn at least a 2.00 grade-point average for all courses completed within their degree program.

Limitations on Source and Time for Credit Acquisition
The college dean or campus chancellor and program faculty may require up to 24 credits of course work in the major to be taken at the location or in the college or program where the degree is earned. Credit used toward degree programs may need to be earned from a particular source or within time constraints (see Senate Policy 83-80 (http://senate.psu.edu/policies-and-rules-for-undergraduate-students/82-00-and-83-00-degree-requirements/#83-80)). For more information, check the Suggested Academic Plan for your intended program.

Requirements for the Major
This includes 24 credits of General Education courses: 9 credits of GN courses; 6 credits of GQ courses; 3 credits of GS courses; 3 credits of GWS courses; 3 credits of GHW courses.

To graduate, a student enrolled in the major must earn a grade of C or better in each course designated by the major as a C-required course, as specified by Senate Policy 82-44 (http://senate.psu.edu/policies-and-rules-for-undergraduate-students/82-00-and-83-00-degree-requirements/#82-44).

Common Requirements for the Major (All Options)

Code	Title	Credits
Prescribed Courses		
CHEM 110	Chemical Principles I	3
CHEM 111	Experimental Chemistry I	1
ENGL 202C	Effective Writing: Technical Writing	3
MATH 140	Calculus With Analytic Geometry I	4
ET 200	Graphic Communications	3
SSET 295	Internship	1
CET 342	Civil Engineering Materials - Concrete and Bituminous	3
CET 343	Soils Mechanics	3
CET 308	Construction Methods and Materials	3
CET 434	Foundations	3
Prescribed Courses: Require a grade of C or better		
CE 254	Personal Occupational Safety	3
CE 333	Construction Management I	3
CET 430	Structural Analysis	3
CET 431	Structural Design-Steel	3
CET 432	Structural Design-Reinforced Concrete	3
CET 435	Construction Estimating	3
Additional Courses		
EGT 101 & EGT 102	Technical Drawing Fundamentals and Introduction to Computer Aided Drafting	2-3
or EDSGN 100	Introduction to Engineering Design	
Select one of the following:		3-4
PHYS 150	Technical Physics I	
PHYS 211	General Physics: Mechanics	
PHYS 250	Introductory Physics I	
Select one of the following:		3-4
PHYS 151	Technical Physics II	
PHYS 212	General Physics: Electricity and Magnetism	
PHYS 251	Introductory Physics II	
Select one of the following:		3
ECON 14	Principles of Economics	
ECON 102	Introductory Microeconomic Analysis and Policy	
ECON 104	Introductory Macroeconomic Analysis and Policy	
MATH 141	Calculus with Analytic Geometry II	4
or STAT 200	Elementary Statistics	
ET 323	Strength of Materials Laboratory	1
or MCHT 214	Strength and Properties of Materials Laboratory	
CE 310	Surveying	3
or SUR 111	Plane Surveying	
Select one of the following:		3
CMPSC 101	Introduction to C++ Programming	
CMPSC 121	Introduction to Programming Techniques	
CMPSC 201	Programming for Engineers with C++	
CMPSC 202		
Select one of the following:		3-4
ACCTG 211	Financial and Managerial Accounting for Decision Making	
MGMT 100	Survey of Management	
MGMT 301	Basic Management Concepts	
Additional Courses: Require a grade of C or better		
Select one of the following:		3
EMCH 211	Statics	
ET 300	Mechanics I: Statics (does not require a grade of C or better)	
MCHT 111	Mechanics for Technology: Statics	
Select one of the following:		3
EMCH 213	Strength of Materials	
ET 322	Strength of Materials	
MCHT 213	Strength and Properties of Materials	
Requirements for the Option		
Select an option		19-22

Requirements for the Option
Construction Management Option (19-21 credits)

Code	Title	Credits
Prescribed Courses		
Prescribed Courses: Require a grade of C or better		
CE 456	Planning and Scheduling	3
CE 458	Construction Management II	3
CE 488C	Capstone Project - Construction	4

Additional Courses		
Select one of the following:		3-4
ACCTG 211	Financial and Managerial Accounting for Decision Making	
MGMT 100	Survey of Management	
MGMT 301	Basic Management Concepts	
Select one of the following:		3
AE 310	Fundamentals of Heating, Ventilating, and Air Conditioning	
CE 321	Highway Engineering	
ENVE 430	Sustainable Engineering	
MET 435	Building Energy Systems	
Supporting Courses and Related Areas		
Select 3-4 credits from approved program list		3-4

Structural Design Option (19-20 credits)

Code	Title	Credits
Prescribed Courses		
EMCH 212	Dynamics	3
Prescribed Courses: Require a grade of C or better		
CE 445	Advanced Structural Analysis	3
CE 449	Advanced Structural Design	3
CE 488D	Capstone Project - Structural Design	4
Additional Courses		
CET 361	Fluid Flow	3
or CE 360	Fluid Mechanics	
Supporting Courses and Related Areas		
Select 3-4 credits from approved program list		3-4

General Option (22 credits)

Code	Title	Credits
Prescribed Courses		
Prescribed Courses: Require a grade of C or better		
CE 445	Advanced Structural Analysis	3
CE 449	Advanced Structural Design	3
CE 456	Planning and Scheduling	3
CE 458	Construction Management II	3
Additional Courses		
AE 310	Fundamentals of Heating, Ventilating, and Air Conditioning	3
or MET 435	Building Energy Systems	
CE 360	Fluid Mechanics	3
or CET 361	Fluid Flow	
Additional Courses: Require a grade of C or better		
CE 488C	Capstone Project - Construction	4
or CE 488D	Capstone Project - Structural Design	

Academic Advising

The objectives of the university's academic advising program are to help advisees identify and achieve their academic goals, to promote their intellectual discovery, and to encourage students to take advantage of both in-and out-of class educational opportunities in order that they become self-directed learners and decision makers.

Both advisers and advisees share responsibility for making the advising relationship succeed. By encouraging their advisees to become engaged in their education, to meet their educational goals, and to develop the habit of learning, advisers assume a significant educational role. The advisee's unit of enrollment will provide each advisee with a primary academic adviser, the information need to plan the chosen program of study, and referrals to other specialized resources.

READ SENATE POLICY 32-00: ADVISING POLICY (http://senate.psu.edu/policies-and-rules-for-undergraduate-students/32-00-advising-policy)

Harrisburg

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Suggested Academic Plan

Harrisburg Campus

The course series listed below provides **only one** of the many possible ways to move through this curriculum. The University may make changes in policies, procedures, educational offerings, and requirements at any time. This plan should be used in conjunction with your degree audit (accessible in LionPATH as either an **Academic Requirements** or **What If** report). Please consult with a Penn State academic adviser on a regular basis to develop and refine an academic plan that is appropriate for you.

First Year

Fall	Credits	Spring	Credits
ENGL 15 or 30[‡]	3	General Education Course	3
EDSGN 100 or 100S	3	ECON 102 or 104[†]	3
CE 100S	1	CAS 100[‡]	3
MATH 41	3	PHYS 150, 211, or 250[†]	3-4
CHEM 110[†]	3	MATH 140[†]	4
CHEM 111[†]	1		
General Education Course	3		
	17		16-17

Second Year

Fall	Credits	Spring	Credits
General Education Course	3	General Education Course	3
PHYS 151, 212, or 251[†]	3-4	CMPSC 101, 121, 200, or 201	3
MATH 141 or STAT 200[†]	4	ENGL 202C[‡]	3
ET 300 or EMCH 211[*]	3	ET 322 or EMCH 213[*]	3
ACCTG 211 or MGMT 301	3-4	ET 323	1
		General Education Course	3
	16-18		16

Third Year

Fall	Credits	Spring	Credits
ET 200	3	CET 343	3
CE 333[*†]	3	CET 308	3
CET 342	3	CET 435[*]	3
ET 321 (or (S)(G) EMCH 212)	3	(S) (G) CET 361 or (C) ACCTG 211 or (C) MGMT 301 [*]	3-4
SUR 111 or CE 310	3	CET 430[*]	3

	SSET 295	1
	15	16-17

Fourth Year

Fall	Credits	Spring	Credits
CET 431*	3	CET 434	3
CET 432*	3	(C) (G) CE 321 Highway Engineering or (C) (G) MET 435 Building Energy Systems or (C) (G) ENVE 430 Sustainable Engineering	3
CE 254*†	3	(S) (G) CE 480D Capstone Project: Structural Design or (C) CE 488C Capstone Project: Construction*	3
(C) (G) CE 456 *	3	(S) (G) CE 445 Advanced Structural Analysis*	3
(S) (G) CE 488D or (C) CE 488C *	1	(S) (G) CE 449 Advanced Structural Design*	3
(C) (S) Approved Slection	3	(C) (G) CE 458 Construction Management*	3
	16		18

Total Credits 130-134

* Course requires a grade of C or better for the major

‡ Course requires a grade of C or better for General Education

Course is an Entrance to Major requirement

† Course satisfies General Education and degree requirement

[1] (C) (S) Approved Selection
Choose from the Approved Selection list.

University Requirements and General Education Notes:

US and IL are abbreviations used to designate courses that satisfy University Requirements (United States and International Cultures).

W, M, X, and Y are the suffixes at the end of a course number used to designate courses that satisfy University Writing Across the Curriculum requirement.

GWS, GQ, GHW, GN, GA, GH, and GS are abbreviations used to identify General Education program courses. General Education includes Foundations (GWS and GQ) and Knowledge Domains (GHW, GN, GA, GH, GS, and Integrative Studies). Foundations courses (GWS and GQ) require a grade of 'C' or better.

Integrative Studies courses are required for the General Education program. N is the suffix at the end of a course number used to designate an Inter-Domain course and Z is the suffix at the end of a course number used to designate a Linked course.

Advising Notes:

Students must complete an option in one of the following areas: Construction (C), Structural Design (S), or General (G).

Program Notes:

- Students must complete a 3-credit course in "United States Cultures (US)" and a 3-credit course in "International Cultures (IL)."
- Entrance into SDCET major require a minimum of 29.1 credits and a 2.0 GPA.
- Graduation in this major: Courses listed with an * requires a grade of C or better and an option area.
- SDCET Approved Selections
- Other engineering or business courses may be accepted with permission of the program chair.
- An option-required courses cannot be used for an Approved Selection

List of Approved Courses

- ACCTG 211 FINANCIAL ACCOUNTING
- MET 435 HVAC
- B LAW 243 (4) or B LAW 242 and 241 (2) (2) LEGAL ENVIRONMENT BUSINESS
- CET 361 FLUID FLOW
- C E 321 HIGHWAY ENGINEERING
- C E 424 PROJECT INFORMATION MODELING
- C E 445 ADVANCED STRUCTURAL ANALYSIS
- C E 449 ADVANCED STRUCTURAL DESIGN
- C E 456 PLANNING & SCHEDULING
- C E 458 CONSTRUCTION MANAGEMENT II
- ENVE 415 HYDROLOGY
- ENVE 430 SUSTAINABLE ENGINEERING
- EET 320 INDUSTRIAL ELECTRICITY and ELECTRONICS
- ET 495 INTERNSHIP
- E MCH 212/MET 321 DYNAMICS
- MET 435 BUILDING ENERGY SYSTEMS
- M E 201 INTRODUCTION TO THERMAL SCIENCE
- M E 300 ENGINEERING THERMODYNAMICS
- MGMT 301 BASIC MGMT CONCEPT

Career Paths

The SDCET program is designed to prepare students for careers in the highly specialized construction industry. It allows for flexible scheduling, enabling students to focus their specialization in either construction or design. Study through these options could lead to opportunities as structural designers for bridges, buildings, or other projects or as project managers for commercial construction projects. Career options may also be available in government for state and federal highway projects and with construction firms in the specialty areas of scheduling, estimating, and cost control. Finally, opportunities may exist for graduates to pursue opportunities as designers, owners, or contractor representatives.

Careers

The U.S. Bureau of Labor Statistics expects excellent employment opportunities in the construction industry for the coming years. Penn State Harrisburg graduates in Structural Design and Construction Engineering Technology have had impressive job placements in the last eight years.

MORE INFORMATION (https://harrisburg.psu.edu/science-engineering-technology/civil-structural-engineering/bachelor-science-structural-design-and-construction-engineering-technology)

Professional Resources

- American Concrete Institute (https://www.concrete.org/students.aspx)

- American Institute of Constructors (http://www.professionalconstructor.org)
- American Institute of Steel Constructors (https://www.aisc.org)
- American Society of Civil Engineers (http://www.asce.org/join)

Accreditation

The Bachelor of Science in Structural Design and Construction Engineering Technology program is accredited by the Engineering Technology Accreditation Commission of ABET.

MORE INFORMATION (http://www.abet.org)

Contact

Harrisburg

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http://harrisburg.psu.edu/science-engineering-technology/civil-structural-engineering/bachelor-science-structural-design-and-construction-engineering-technology