CIVIL ENGINEERING, B.S. (CAPITAL)

Begin Campus: Any Penn State Campus

End Campus: Harrisburg

Degree Requirements
For the Bachelor of Science degree in Civil Engineering, a minimum of 127 credits is required:

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Education</td>
<td>45</td>
</tr>
<tr>
<td>Requirements for the Major</td>
<td>109</td>
</tr>
</tbody>
</table>

27 of the 45 credits for General Education are included in the Requirements for the Major. This includes: 9 credits of GN courses; 6 credits of GQ courses; 3 credits of GS courses; 9 credits of GWS courses.

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 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 (https://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

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
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).

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 111</td>
<td>Experimental Chemistry I</td>
<td>1</td>
</tr>
<tr>
<td>GEOSC 1</td>
<td>Physical Geology</td>
<td>3</td>
</tr>
<tr>
<td>MATH 220</td>
<td>Matrices</td>
<td>2</td>
</tr>
<tr>
<td>STAT 401</td>
<td>Experimental Methods</td>
<td>3</td>
</tr>
</tbody>
</table>
| Prescribed Courses: Require a grade of C or better
| CE 310 | Surveying                                  | 3       |
| CE 321 | Highway Engineering                         | 3       |
| CE 332 | Professionalism, Economics & Construction | 3       |
| CE 335 | Engineering Mechanics of Soils             | 3       |
| CE 336 | Materials Science for Civil Engineers      | 3       |
| CE 340 | Structural Analysis                         | 3       |
| CE 360 | Fluid Mechanics                             | 3       |
| CE 370 | Introduction to Environmental Engineering  | 3       |
CHEM 110 Chemical Principles I 3
EDSGN 100 Cornerstone Engineering Design 3
EMCH 211 Statics 3
EMCH 212 Dynamics 3
EMCH 213 Strength of Materials 3
ENGL 202C Effective Writing: Technical Writing 3
MATH 140 Calculus With Analytic Geometry I 4
MATH 141 Calculus with Analytic Geometry II 4
MATH 251 Ordinary and Partial Differential Equations 4
PHYS 211 General Physics: Mechanics 4
PHYS 212 General Physics: Electricity and Magnetism 4

Additional Courses

CE 337 Civil Engineering Materials Laboratory 1
or CE 475 Water Quality Chemistry

CHE 220 Introduction to Chemical Engineering Thermodynamics 2
or ME 201 Introduction to Thermal Science

CMPSC 200 Programming for Engineers with MATLAB
or CMPSC 201 Programming for Engineers with C++

Select one of the following:

1 CE 100S Topics and Contemporary Issues in Civil and Environmental Engineering: First-Year Seminar
1 credit of First-Year Seminar or Elective

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

Select 6 credits of the following:

6 CE 341 Design of Concrete Structures
CE 342 Design of Steel Structures
CE 371 Water and Wastewater Treatment
CE 441 Structural Design of Foundations
CE 447 Structural Analysis by Matrix Methods
CE 461 Water-resource Engineering
CE 462 Open Channel Hydraulics
CE 475 Water Quality Chemistry
CE 476 Solid and Hazardous Wastes
CE 479 Environmental Microbiology for Engineers

Select 3 credits of CE 400 level "W" courses

Additional Courses: Require a grade of C or better

CAS 100A Effective Speech
or CAS 100B Effective Speech

ENGL 15 Rhetoric and Composition
or ENGL 30H Honors Rhetoric and Composition

Supporting Courses and Related Areas

Select 12 credits of technical elective from CE 300-level courses, CE 400-level courses, or department list

1 Two of those courses must be selected from at least 2 of the 3 remaining technical areas in the Civil Engineering program—structures (x40), hydrosystems (x60), and environmental (x70).

1 If CE 475 is taken, one credit goes toward lab requirement and remaining three go towards CE or general technical electives.
2 Students may substitute 6 credits of ROTC for 3 credits of GHW courses and 3 credits of ME.