UNIVERSITY OF THE PACIFIC

Civil Engineering

CIVIL ENGINEERING AT UNIVERSITY OF THE PACIFIC

The Civil Engineering program is widely known for its practical curriculum, high academic standards and student-centered emphasis. The Civil Engineering program is accredited by the Engineering Accreditation Commission of ABET, https://www.abet.org, under the General Criteria and the Civil Engineering Program Criteria.

DEPARTMENT MISSION

The Department of Civil Engineering seeks to develop graduates who have the knowledge, skills and qualities required for professional licensure, advanced level studies, and practice and leadership in the civil engineering profession.

CIVIL ENGINEERING PROGRAM EDUCATIONAL OBJECTIVES

Within a few years of graduation, graduates of the Civil Engineering program are expected to:

+ Plan, design, evaluate, construct, maintain, operate, analyze, advance, and manage civil engineering systems
+ Pursue professional licensure and certifications
+ Engage in lifelong learning and pursue advanced level studies
+ Demonstrate leadership skills through career advancement and active participation in the civil engineering profession and in the community

COOPERATIVE EDUCATION CURRICULUM COMPONENT

Practical work experience (cooperative education or CO-OP) is an integral part of civil engineering education at University of the Pacific. All students who are U.S. citizens are required to complete 32 units of CO-OP, which entails a seven month work period. Consequently, earning a B.S. degree in Civil Engineering may take longer than four years. Experience gained during co-op gives Pacific civil engineering graduates a significant advantage when they seek employment after graduation.

CIVIL ENGINEERING PROGRAM REQUIREMENTS

Requirements for the degree of Bachelor of Science in Civil Engineering include a minimum of 120 units in four general areas: civil engineering, engineering science, mathematics and science, and general education.

CIVIL ENGINEERING AREAS EMPHASIZED IN THE CURRICULUM:

+ Environmental engineering – design and supervise the construction of systems for water treatment, waste disposal, and for air and water pollution control
+ Infrastructure Systems - design and manage infrastructure including roadways, bridges, and water and wastewater systems
+ Structural engineering – design and supervise the construction of structures of various forms, including bridges and buildings
+ Water resources engineering – design and supervise the construction of systems for water supply, hydropower, irrigation, drainage, flood control, and navigation

To provide depth in one or more of these areas, students choose four civil engineering elective courses in addition to the core civil engineering curriculum.

For more information, contact:
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UNIVERSITY OF THE PACIFIC | School of Engineering and Computer Science

REQUIREMENTS AND SAMPLE CURRICULUM FOR THE DEGREE OF BACHELOR OF SCIENCE IN CIVIL ENGINEERING

*EFFECTIVE FALL 2023

1ST YEAR

FALL

ENGR 10 [1] DEAN'S SEMINAR
CIVL 15 [3] CIVIL ENGINEERING GRAPHICS
MATH 51 [4] CALCULUS I
CORE 1 [3] PROBLEM SOLVING & ORAL COMMUNICATION
GE ELECTIVE [3-4]
TOTAL UNITS [14-15]

SPRING

PHYS 53 [5] PHYSICS I
MATH 53 [4] CALCULUS II
CORE 2 [4] WRITING AND CRITICAL THINKING
CIVL 22 [3] (CE ELECTIVE)
TOTAL UNITS [16]

2ND YEAR

FALL

ENGR 20 [3] MECHANICS I (STATICS)
ENGR 19 [3] COMP. APPLICATIONS IN ENGR
MATH 55 [4] CALCULUS III
CHEM 24, 25 OR 27 [4-5]
GE ELECTIVE [3-4]
TOTAL UNITS [17-18]

SPRING

CIVL 60 [4] WATER QUALITY
ENGR 121 [3] MECHANICS OF MATERIALS
ENGR 45 [4] MATERIALS ENGINEERING
MATH 57 [4] DIFFERENTIAL EQUATIONS
TOTAL UNITS [15]

SUMMER

EMGT 170 [4] PROJECT DECISION MAKING
ENGR 120 [3] MECHANICS II (DYNAMICS)
MATH/SCIENCE ELECTIVE [3-4]
ENGR 30 [3] ENGR. & COMP. ETHICS IN SOCIETY
GE ELECTIVE [3-4]
TOTAL UNITS [16-18]

3RD YEAR

FALL

CIVL 130/130L [3/1] FLUID MECHANICS I
CIVL 132 [4] ENVIRONMENTAL ENGR
LIFE/GEO SCIENCE ELECTIVE [3-4]
100-LEVEL SOECS ELECTIVE OR ECPE 41/L [3-4]
TOTAL UNITS [14-16]

SPRING

CIVL 100 [4] STRUCTURAL ENGR
CIVL 133 [4] WATER RESOURCES ENGR
CIVL 140 [4] GEOTECHNICAL ENGR CIVL
ELECTIVE [3-4]
ENGR 25 [1] PROFESSIONAL PRACTICE
TOTAL UNITS [16-17]

4TH YEAR

FALL

ENGR 181 [16] CO-OP (SUMMER OF 3RD YEAR)
ENGR 182 [16] CO-OP (FALL OF 4TH YEAR)
TOTAL CO-OP UNITS [32]

SPRING

CIVL 180 [4] ENGR SYNTHESIS
STRUCTURAL ELECTIVE [4] (CIVIL 164, 165 OR 166)
CIVL DESIGN ELECTIVE [4]
GE ELECTIVE [3-4]
TOTAL UNITS [15-16]

Minimum number of units required = 120 plus 32 units of CO-OP. This schedule presents all course requirements in a concise form. Degree completion time may vary based on units completed prior to enrollment, activities, interests, and constraints.

CIVL [45-47 units]
ENGR [26-27 units]
MATH/SCI [31-34 units] (min. 30 units required)
GEN ED [23-26 units]

CIVIL ELECTIVES: All Civil Engineering students are required to take a minimum of four courses (12 units min.) of CIVL electives. Of these electives, one must be a structural design course (e.g., CIVL 164, 165 or 166) and another must be a nonstructural course from the design category.

ANALYSIS:

CIVL 22 GEOMATICS
CIVL 134 GROUNDWATER
CIVL 145 ENGINEERING GEOLOGY
CIVL 160 STRUCTURAL ANALYSIS
CIVL 163 EARTHQUAKE ENGINEERING
CIVL 171 WATER AND ENVIRONMENTAL POLICY
CIVL 173 SUSTAINABLE ENGINEERING
EMGT 115 BUILDING INFORMATION MODELING
EMGT 174 PROJECT MANAGEMENT
CIVL 197 UNDERGRADUATE RESEARCH

DESIGN:

CIVL 136 DESIGN OF WASTEWATER FACILITIES
CIVL 138 SOLID WASTE SYSTEMS
CIVL 141 FOUNDATION DESIGN
CIVL 150 TRANSPORTATION ENGINEERING
CIVL 151 HEAVY CONSTRUCTION METHODS
CIVL 164 STRUCTURAL TIMBER DESIGN
CIVL 165 STRUCTURAL STEEL DESIGN
CIVL 166 REINFORCED CONCRETE DESIGN
CIVL 191 INDEPENDENT STUDY (MAY ALSO BE ANALYSIS)
CIVL 193 SPECIAL TOPICS (MAY ALSO BE ANALYSIS)

LIFE/GEO SCIENCE ELECTIVES (one required): other electives are subject to departmental approval
BIOL 35, 41, 51, 61, GESC 41, 51, 53, 102, 148

MATH/SCIENCE ELECTIVES (may include LIFE/GEO SCIENCE ELECTIVES above plus): other electives subject to departmental approval
CHEM 27, 121, 123, 161, PHYS 55, 57 MATH 37, 39, 72, 110, 130, 131, 141, 145

GEN EDUCATION (GE) AND GE ELECTIVES:
Students entering Pacific as first-year students are required to take CORE 1, CORE 2, and five GE courses, four of which are electives. Transfer students should discuss GE requirements with an advisor.

DEGREE COMPLETION:
The civil engineering plan of study typically requires a minimum of eight (8) semesters of academic coursework, plus two (2) semesters of co-op. Students not prepared to enter directly into the major will need to take prepatory courses, which may extend the time to degree completion. The following courses are considered prepatory for civil engineering majors:

- **Mathematics: Courses in the prerequisite sequence leading to MATH 51**
- **Physics: Courses in the prerequisite sequence leading to PHYS 53**
- **Chemistry: Courses in the prerequisite sequence leading to CHEM 24 or 25**
- **Writing (WRIT) courses**