



# 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, <http://www.abet.org>.

### 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.

### THE CIVIL ENGINEERING AREAS EMPHASIZED IN THE CURRICULUM ARE:

- + Environmental engineering – design and supervise the construction of systems for water treatment, waste disposal, and for air and water pollution control
- + Geotechnical engineering – design and supervise the construction of building foundations, tunnels, dams, and retaining walls
- + 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

|                      |        |  |
|----------------------|--------|--|
| 1 <sup>ST</sup> YEAR | FALL   | <p><b>ENGR 10 [1] DEAN'S SEMINAR</b><br/> <b>CIVL 15 [3] CIVIL ENGINEERING GRAPHICS</b><br/> <b>MATH 51 [4] CALCULUS I</b><br/> <b>PACS 1 [4] PACIFIC SEMINAR I</b><br/> <b>GE ELECTIVE [3-4]</b><br/>                 TOTAL UNITS [15-16]</p> |
|                      | SPRING | <p><b>PHYS 53 [5] PHYSICS I</b><br/> <b>MATH 53 [4] CALCULUS II</b><br/> <b>PACS 2 [4] PACIFIC SEMINAR II</b><br/> <b>CIVL 22 [3] (CE ELECTIVE)</b><br/>                 TOTAL UNITS [16]</p>  |

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| 2 <sup>ND</sup> YEAR | FALL   | <p><b>ENGR 20 [3] MECHANICS I (STATICS)</b><br/> <b>ENGR 19 [3] COMP. APPLICATIONS IN ENGR</b><br/> <b>MATH 55 [4] CALCULUS III</b><br/> <b>CHEM 24, 25 OR 27 [4-5]</b><br/> <b>GE ELECTIVE [3-4]</b><br/>                 TOTAL UNITS [17-18]</p>                                     |
|                      | SPRING | <p><b>CIVL 60 [4] WATER QUALITY</b><br/> <b>ENGR 121 [4] MECHANICS OF MATERIALS</b><br/> <b>ENGR 45 [4] MATERIALS ENGINEERING</b><br/> <b>MATH 57 [4] DIFFERENTIAL EQUATIONS</b><br/>                 TOTAL UNITS [16]</p>   |
|                      | SUMMER | <p><b>EMGT 170 [4] PROJECT DECISION MAKING</b><br/> <b>ENGR 120 [3] MECHANICS II (DYNAMICS)</b><br/> <b>MATH/SCIENCE ELECTIVE [3-4]</b><br/> <b>ENGR 30 [3] ENGR. &amp; COMP. ETHICS IN SOCIETY (GEIIB)</b><br/> <b>GE ELECTIVE [3-4]</b><br/>                 TOTAL UNITS [16-18]</p> |

|                      |        |  |
|----------------------|--------|--|
| 3 <sup>RD</sup> YEAR | FALL   | <p><b>CIVL 130/130L [3/1] FLUID MECHANICS I</b><br/> <b>CIVL 132 [4] INTRO TO ENVIRONMENTAL ENGR</b><br/> <b>LIFE/GEO SCIENCE ELECTIVE [3-4]</b><br/> <b>100-LEVEL SOECS ELECTIVE OR ECPE 41/L [3-4]</b><br/>                 TOTAL UNITS [14-16]</p>                        |
|                      | SPRING | <p><b>CIVL 100 [4] INTRO TO STRUCTURAL ENGR</b><br/> <b>CIVL 133 [4] WATER RESOURCES ENGR</b><br/> <b>CIVL 140 [4] INTRO TO GEOTECHNICAL ENGR</b><br/> <b>CIVL ELECTIVE [3-4]</b><br/> <b>ENGR 25 [1] PROFESSIONAL PRACTICE</b><br/>                 TOTAL UNITS [16-17]</p> |

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|----------------------|--------|---|
| 4 <sup>TH</sup> YEAR | FALL   | <p><b>ENGR 181 [16] CO-OP (SUMMER OF 3<sup>RD</sup> YEAR)</b><br/> <b>ENGR 182 [16] CO-OP (FALL OF 4<sup>TH</sup> YEAR)</b><br/>                 TOTAL CO-OP UNITS [32]</p>   |
|                      | SPRING | <p><b>CIVL 180 [4] ENGR SYNTHESIS</b><br/> <b>STRUCTURAL ELECTIVE [4] (CIVIL 164, 165 OR 166)</b><br/> <b>CIVL DESIGN ELECTIVE [4]</b><br/> <b>PACS 3 [3] PACIFIC SEMINAR III</b><br/>                 TOTAL UNITS [15]</p> |

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:**

Civil Engineering students entering Pacific as freshman are required to take the Pacific Seminar series and four GE courses, three of which are electives. Transfer students should discuss GE requirements with an advisor.