



## Executive Memorandum 22-001

February 3, 2022

**From:** Gayle E. Hutchinson, President

A handwritten signature in black ink that reads "Gayle E. Hutchinson".

**Subject:** Approval of the New Option in Environmental and Water Resources Engineering within the BS in Civil Engineering

Upon the recommendation of the Academic Senate, and with the concurrence of the Provost, I approve the new Option in Environmental and Water Resources Engineering within the BS in Civil Engineering, Department of Civil Engineering, College of Engineering, Computer Science, and Construction Management. The new option will require 13 units, will use CSU code 09081 with a related CIP code of 14.0801, and will be effective fall 2022.

<b>Policy Title:</b>	EM 22-001 New Option in Environmental and Water Resources Engineering within the BS in Civil Engineering
<b>Contact:</b>	Department of Civil Engineering
<b>Supersedes:</b>	
<b>Revision:</b>	
<b>Enabling Legislation or Executive Order:</b>	



Academic Programs, Innovations and Faculty Development  
401 Golden Shore, 6th Floor  
Long Beach, CA 90802-4210

www.calstate.edu

November 29, 2021

Dr. Daniel Grassian  
Vice Provost for Academic Affairs  
California State University, Chico  
400 West First Street  
Chico, California 95929

Dear Daniel,

Thank you for notifying us that California State University, Chico has approved options in the Bachelor of Science in Civil Engineering as follows:

<b>Degree</b>	<b>Degree/CIP Code</b>	<b>Options</b>	<b>Option/CIP Code</b>
BS Civil Engineering	09081/14.0801	General	09081/14.0801
BS Civil Engineering	09081/14.0801	Structural Engineering	09081/14.0801
BS Civil Engineering	09081/14.0801	Environmental and Water Resources Engineering	09081/14.0801

The concentrations and required courses appear to fit with existing policy, and therefore may be added to the CSU Degrees Database at any time.

If you have questions, please contact me at awrynn@calstate.edu or at (562) 951-4672.

Sincerely,

Alison Wrynn (Nov 30, 2021 15:48 PST)

Alison M. Wrynn, Ph.D.  
Associate Vice Chancellor, Academic Programs, Innovation and Faculty Development

CSU Campuses  
Bakersfield  
Channel Islands  
Chico  
Dominguez Hills  
East Bay

Fresno  
Fullerton  
Humboldt  
Long Beach  
Los Angeles  
Maritime Academy

Monterey Bay  
Northridge  
Pomona  
Sacramento  
San Bernardino  
San Diego

San Francisco  
San José  
San Luis Obispo  
San Marcos  
Sonoma  
Stanislaus

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AMW/BF

cc: Dr. Debra Larson, Provost and Vice President for Academic Affairs  
Dr. Kate McCarthy, Dean of Undergraduate Education

**Signature:**

**Email:** a\_wrynn@hotmail.com

# New Undergraduate Option

**Program Name:** Environmental and Water Resources Engineering

Program named above is an option within:

BS Civil Engineering

(degree program name)

**Department Contact(s) w/phone #(s):**



Steffen Mehl 5456

## Required Signatures

The Department of Civil Engineering  
has reviewed and approved this new program


<u></u>	<u>3/25/2021</u>
Chair, Department Curriculum Committee	Date
<u></u>	<u>3/25/2021</u>
Department Chair	Date

The College of ECC  
has reviewed and approved this new program

<u></u> <small>Clarke Steinback (Mar 26, 2021 13:22 PDT)</small>	<u>Mar 26, 2021</u>
Chair, College Curriculum Committee	Date
<u></u> <small>Blake Wentz (Mar 26, 2021 14:50 PDT)</small>	<u>Mar 26, 2021</u>
College Dean	Date

Send signature page with proposal attached to Curriculum Services at zip 128

Curriculum Review Completed

  
Date 8/23/2021

Note: The department will be notified of the dates for EPPC, Academic Senate, WASC, and Chancellor's Office review.

## Proposal for a New Option

- I. Proposed title of new option and name of degree program under which the new option will be offered. *Environmental and Water Resources Engineering within BS Civil Engineering*
- II. Academic year of intended implementation. *2022-2023*
- III. Name of the department and college submitting the proposal. *Civil Engineering*
  - A. Identify the unit which will have primary responsibility for the option. *Department of Civil Engineering*
  - B. Identify the level of the option (i.e., undergraduate or graduate). *Undergraduate*
- IV. Statements on questions of need and demand.
  - A. Relation of the program to the [University Strategic Plan](#).  
*The proposed changes relate most directly to the “Resilient & Sustainable Systems” part of the University’s Strategic Plan. The work of Environmental and Water Resources Engineers is directly linked with managing environmental resources, like air, water, land, and energy for the public good. Poor stewardship of these resources can lead to unsustainable practices, like over exploitation (e.g. mining of groundwater in the San Joaquin Valley) and contamination (e.g. Flint Michigan). Many of these issues are exacerbated with climate change as we expect many parts of California (and the world) to experience more severe droughts. Water scarcity issues are often more acute on poorer parts of the population. It is important that the next generation of civil engineers have options for additional study in the areas of environmental and water resources engineering.*
  - B. Need for the proposed option.
    1. Identify other CSU campuses with the proposed option. *Of the 13 CSUs that offer BS degrees in either Civil or Environmental engineering, only Pomona offers a degree option of environmental engineering under Civil Engineering. Also, our program would be a blend of environmental-water resources engineering, so it would have more of a water focus than Pomona’s program*
    2. Identify neighboring institutions with the proposed option. *None. UC Davis has a degree in Environmental Engineering. Sac State has an MS in Environmental Engineering.*
    3. Identify differences, if any, between these programs and the proposed program. *our program would be a blend of environmental-water resources engineering, so it would have more of a water focus than Pomona’s program.*
  - C. Identify other closely related curricula currently offered by the campus.

1. Explain the impact the proposed option will have on these programs. *There are no other civil engineering courses offered. Mechanical Engineering and Construction Management are the two most closely related fields..*
  2. Explain how current programs do not meet the proposed option's objectives. *They don't offer an option under civil engineering. Rather, they offer a complete degree in a very different area.*
- D. Student demand for the program.
1. Give evidence of serious student interest in the proposed option. *A contaminant transport class that was taught as a 599 a few years ago also had over 40 students.*
  2. Estimated number of students seeking the option
    - a. in the year of initiation. *10*
    - b. after three years. *15*
    - c. after five years. *20*
    - d. Describe methodology for developing these estimates. *I surveyed the CIVL 101 class and 77% were interested in a structural option, 23% were not. 54% were interested in a water/environmental option, 46% were not*
  3. Estimate the number of options awarded
    - a. in the year of initiation. *0*
    - b. after three years. *10*
    - c. after five years. *20*
    - d. Describe methodology for developing these estimates. *I surveyed the CIVL 101 class and 77% were interested in a structural option, 23% were not. 54% were interested in a water/environmental option, 46% were not*
    - e. Identify professional uses for the proposed option. *environmental engineers, water resource engineers.*

## V. Resources

- A. List the faculty members for the required courses in the program by *All faculty in CIVL will teach in the core courses. See the Faculty directory for the information for each faculty member:*  
<https://www.csuchico.edu/ce/people/index.shtml>
- B. List the resources needed to sustain the program for the first five years, including cost and funding source. *Because the option is a coherent grouping of existing courses, no additional resources are required beyond our current program.*
  1. Faculty
  2. Staff
  3. Facilities

4. Library resources; provide evidence of consultation with the Library Dean indicating that the program can be supported by the library. *See attached letter, page 23.*
5. Equipment
6. Specialized material

C. Additional support resources required, including source of support. *None*

## VI. Curriculum

Note: Proposed curriculum should take advantage of courses already offered in other departments when subject matter would otherwise overlap or duplicate existing course content.

- A. Total number of units required for option. *12 - 14*
- B. Special criteria for admission and/or continuation (if applicable). *None*
- C. Explanation of any special program characteristics (e.g., terminology, credit units required, types of coursework, etc.). *None*
- D. List all new courses for the proposed program. *None*
- E. List all required courses for the program. *There are 91-93 units in the Major Core Requirements. This option is essentially our current degree program where students can take courses in both structural and environmental engineering, except the selections are limited in a coherent way to those in the environmental/water area. See marked up catalog for details*
- F. List all elective courses for the program. *The electives are the same as our current degree program, except limited in a coherent way to those in the environmental/water area. Key features are:*
  - *Take CIVL 331 – Environmental Engineering Chemistry (3)*
  - *Take CIVL 431 Water & Wastewater Engineering (4)*
  - *Select 1 capstone elective from:*
    - CIVL 561C – Hydrology & Open Channel Hydraulics (3)*
    - CIVL 562C – Groundwater Hydrology (3)*
    - CIVL 564C – Spatial Hydrology (3)*
    - CIVL 571C – Natural Systems for Wastewater Treatment (3)*
    - CIVL 575C – Solid and Hazardous Waste Management (3)*
  - *Select 1 engineering elective from (must be different than capstone):*
    - CIVL 561 – Hydrology & Open Channel Hydraulics (3)*
    - CIVL 562 – Groundwater Hydrology (3)*
    - CIVL 564 – Spatial Hydrology (3)*
    - CIVL 567 – Pipeline Hydraulics & Design (3)*
    - CIVL 571 – Natural Systems for Wastewater Treatment (3)*
    - CIVL 573 – Water Quality and Contaminant Transport (3)*
    - CIVL 575 – Solid and Hazardous Waste Management (3)*

*See marked up catalog for details*

- G. For undergraduate options, explain provisions for articulation of the proposed option with community college courses. *Same as before and only applies to the core classes*
- H. For undergraduate options, will the new option be matched to an existing associate degree, as specified in SB 1440, and if so, is it certain that the new degree option will not require a student to repeat courses similar to those taken for the associate degree? *Not matched*
- I. Writing Requirement
  - 1. For an undergraduate option, list the number and title of the Graduation Writing Assessment (GWAR) course for the option. *CIVL 595W Capstone Design Project (W)*
  - 2. List the GWAR course for the degree program if it is different from the GWAR course for the option. *N/A*
  - 3. For a graduate option, indicate how the graduate literacy requirement is met within the option and/or degree program. *N/A*
- J. For a graduate option, indicate the culminating activity for the option and/or degree program. *N/A*
- K. Complete catalog copy, including full degree requirements (i.e., a catalog description of the full degree program, not just the option being proposed), and admission and completion requirements. See the current University Catalog for correct format; please follow it exactly. Before the proposal is submitted to Academic Affairs (for undergraduate options) or to the Office of Graduate Studies (for graduate program options), it may be helpful to review catalog copy with Academic Publications. *See attached, page 6*
- L. For undergraduate programs, include a [Major Academic Plan](#) (MAP) with the proposal. If you have questions or need help, contact [Academic Advising Programs](#). *See attached, page 22*

Attach the [Undergraduate Program Signature form](#) or the [Graduate Program Signature form](#) to the front of the proposal and submit to Curriculum Services or the Office of Graduate Studies after all department and college reviews are complete.



# The Bachelor of Science in Civil Engineering

Civil engineering graduates are well prepared for professional work or graduate school in a broad spectrum of engineering activities. The program is balanced, stressing environmental engineering; soil mechanics and foundations; structural analysis and design; surveying and mapping; transportation and traffic engineering; and water resources and hydraulics. The program emphasizes quality undergraduate teaching with most courses taught by tenure track faculty and active student learning, including extensive use of laboratories and co-curricular activities.

## Civil Engineering Program Mission

The civil engineering program prepares graduates for immediate entry into a variety of professional careers and provides a solid undergraduate foundation in general principles enabling continued education at advanced levels.

## Civil Engineering Educational Objectives

Program educational objectives are broad statements that describe the career and professional accomplishments that the program is preparing graduates to achieve. Graduates of the civil engineering program will be able to:

- Secure a professional position in civil engineering and become a licensed engineer.
- Attend graduate school in civil engineering or a related discipline to achieve a graduate degree in a specialty area.
- Engage in lifelong learning through formal and informal professional development.
- Assume management or leadership roles in their respective organization.
- Contribute to society through involvement in service activity.

## Civil Engineering Program Learning Outcomes

- Students completing the civil engineering program must demonstrate the ability to:

1. Identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. Apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
3. Communicate effectively with a range of audiences.
4. Recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
5. Function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.

6. Develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
7. Acquire and apply new knowledge as needed, using appropriate learning strategies.

### **Civil Engineering Design Experience**

The civil engineering program provides an essential balance of engineering science and design. Design content permeates the curriculum, beginning at a fundamental level in the lower division followed by a natural progression to comprehensive design in upper-division courses. Fundamental design problems typically have a unique solution and may involve only a few, simple constraints. Comprehensive design incorporates a multitude of realistic constraints with a variety of possible outcomes commonly referred to as "open-ended" design.

Required courses in the program provide proficiency in civil engineering design, beginning in the first year (CIVL 140 Transportation Planning, Surveying, and Graphics) progressing to advanced design in the third and fourth years (CIVL 415 Reinforced Concrete Design, CIVL 431 Environmental Engineering, CIVL 441 Transportation Engineering, and CIVL 461 Water Resources Engineering), and culminating with comprehensive design in the capstone (e.g., CIVL 558C Earthquake and Wind Engineering Capstone, CIVL 561C Hydrology and Open Channel Hydraulics Capstone, etc.). This ensures a breadth of design experience that is further enhanced and focused in elective courses.

### **American Public Works Association Internship Program**

The APWA Internship Program provides civil engineering students with valuable real-world experiences. Participation in the program is elective but can be used for academic credit towards the degree. While students are responsible for finding their own internship opportunity, the [Career Center](#) is an excellent resource for locating companies interested in hiring interns. Additional information is available at the civil engineering department website.

## **Total Course Requirements for the Bachelor's Degree: 128 units**

See [Bachelor's Degree Requirements](#) in the *University Catalog* for complete details on general

A suggested Major Academic Plan (MAP) has been prepared to help students meet all graduation requirements within four years. You can view MAPs on the [Major Academic Plans](#) page or you can request a plan from your major advisor.

Courses in this program may complete more than one graduation requirement.

### **General Education Pathway Requirements: 48 units**

See [General Education](#) in the *University Catalog* and the [Class Schedule](#) for the most current information on General Education Pathway Requirements and course offerings.

This major has approved GE modification(s). See below for information on how to apply these modification(s).

- Take CMST 131 for Oral Communication (Area A1)
- Critical Thinking (Area A3) is waived.
- Take only one course in either Arts (Area C1) or Humanities (Area C2). The other is waived.
- CIVL 302W fulfills Social Sciences (Area D).
- CIVL 495 fulfills Lifelong Learning and Self-Development (Area E).
- CIVL 461 is an approved major course substitution for Upper-Division Scientific Inquiry and Quantitative Reasoning (Area UD-B).

### **Accreditation Requirement**

Courses must be selected in such a manner as to satisfy the humanities, social science, mathematics, base science, and engineering topics requirements of the [ABET](http://www.abet.org), <http://www.abet.org>. Consult your academic advisor for additional information.

### **Diversity Course Requirements: 6 units**

See [Diversity Requirements](#) in the *University Catalog*. Most courses taken to satisfy these requirements may also apply to [General Education](#).

### **Upper-Division Writing Requirement:**

Writing Across the Curriculum ([Executive Memorandum 17-009](#)) is a graduation requirement and may be demonstrated through satisfactory completion of four Writing (W) courses, two of which are designated by the major department. See [Mathematics/Quantitative Reasoning and Writing Requirements](#) in the *University Catalog* for more details on the four courses. The first of the major designated Writing (W) courses is listed below.

- CIVL 302W Engineering Sustainability and Economic Analysis (W) 3.0 FS W

The second major-designated Writing course is the Graduation Writing Assessment Requirement (GW) ([Executive Order 665](#)). Students must earn a C- or higher to receive GW credit. The GE Written Communication (A2) requirement must be completed before a student is permitted to register for a GW course.

### **Grading Requirement:**

All courses taken to fulfill major course requirements must be taken for a letter grade except those courses specified by the department as Credit/No Credit grading only.

## Course Requirements for the Major: 103-107 units

Completion of the following courses, or their approved transfer equivalents, is required of all candidates for this degree.

Enrollment in any mathematics course requires a grade of C- or higher in all prerequisite courses or their transfer equivalents.

### Major Core Requirements: 91 -93 units

#### Lower-Division Requirements Core: 48-49 units

##### 13 courses required:

CHEM 111	General Chemistry	4.0	FS	GE
Prerequisites: GE Mathematics/Quantitative Reasoning Ready; second-year high school algebra; one year high school chemistry. (One year of high school physics and one year of high school mathematics past Algebra II are recommended.)				
CIVL 101	Introduction to Civil Engineering	1.0	FA	
CIVL 130	Surveying	3.0	FA	
Prerequisites: MATH 120 (may be taken concurrently).				
CIVL 140	Transportation Planning, Surveying, and Graphics	3.0	SP	
Prerequisite: CIVL 130.				
CIVL 175	Biological Processes in Environmental Engineering	3.0	FS	GE
Prerequisites: High school biology and chemistry.				
CIVL 205	Computer Applications in Engineering	2.0	FS	
Prerequisite: PHYS 204A (may be taken concurrently).				
CIVL 211	Statics	3.0	FS	
Prerequisites: MATH 121, PHYS 204A.				
CIVL 231	Introduction to Environmental Engineering	3.0	FS	
Prerequisites: CHEM 111, CIVL 175 (may be taken concurrently).				
MATH 120	Analytic Geometry and Calculus	4.0	FS	GE
Prerequisites: GE Mathematics/Quantitative Reasoning Ready; both MATH 118 and MATH 119 (or college equivalent); first-year freshmen who successfully completed trigonometry and precalculus in high school can meet this prerequisite by achieving a score that meets department guidelines on a department administered calculus readiness exam.				
MATH 121	Analytic Geometry and Calculus	4.0	FS	
Prerequisite: MATH 120.				

MATH 260 Elementary Differential Equations 4.0 FS

Prerequisites: MATH 121.

~~MECH 208 Introduction to Technical Computing - 2.0 FS -~~

~~Prerequisite: MATH 121. Recommended: PHYS 204A.~~

PHYS 204A Physics for Students of Science and Engineering: Mechanics 4.0 FS GE

Prerequisites: High school physics or faculty permission. Concurrent enrollment in or prior completion of MATH 121 (second semester of calculus) or equivalent.

PHYS 204B Physics for Students of Science and Engineering: Electricity and Magnetism 4.0 FS

Prerequisites: MATH 121, PHYS 204A with a grade of C- or higher.

**1 course selected from:**

BIOL 211 Allied Health Microbiology 4.0 FS

Prerequisites: BIOL 103, BIOL 104, BIOL 151, or SCED 102; CHEM 107, CHEM 108, or CHEM 111.

CHEM 112 General Chemistry 4.0 FS

Prerequisites: CHEM 111 with a grade of C- or better.

GEOS 102 Physical Geology  3.0 FS GE

Prerequisites: High school chemistry or physics is recommended; students with no previous science courses are advised to enroll in GEOS 101. No college credit for those who have passed GEOS 101.

PHYS 204C Physics for Students of Science and Engineering: Heat, Wave Motion, Sound, Light, and Modern Topics 4.0 FS

Prerequisites: MATH 121, PHYS 204A with a grade of C- or higher.

**1 course selected from:**

CIVL 212 Civil Engineering Materials 3.0 FS

Prerequisite: CHEM 111.

MECH 210 Materials Science and Engineering 3.0 FS

Prerequisites: CHEM 107 or CHEM 111, PHYS 202A or PHYS 204A.

Corequisite: MECH 210L for MECA, MECH, and SMFG majors only.

**Upper-Division Requirements Core: ~~55-58~~ 43 - 44 units**

**9 courses required:**


CIVL 302W Engineering Sustainability and Economic Analysis (W) 3.0 FS W  
 Prerequisites: MATH 121, junior standing.


CIVL 311 Strength of Materials 4.0 FS  
 Prerequisites: CIVL 211 with a grade of C- or higher; MATH 260 (may be taken concurrently); CIVL 212 or MECH 210 (may be taken concurrently).

CIVL 313 Structural Mechanics 3.0 FS  
 Prerequisites: Prerequisites: CIVL 311 with a grade of C- or higher; MECH 208 (may be taken concurrently).

CIVL 321 Fluid Mechanics 4.0 FS  
 Prerequisites: CIVL 211 with a grade of C- or higher. Recommended: MATH 260, MECH 320 (may be taken concurrently).

CIVL 411 Soil Mechanics and Foundations 4.0 SP  
 Prerequisites: CIVL 321 (may be taken concurrently); ENGL 130W or equivalent.

CIVL 441 Transportation Engineering  4.0 FA  
 Prerequisites: CIVL 140; CIVL 302W (may be taken concurrently).

CIVL 461 Water Resources Engineering  3.0 SP  
 Prerequisites: CIVL 205 or MECH 208; CIVL 321 with a grade of C- or higher.

CIVL 495 Professional Issues in Engineering 3.0 FS  
 Prerequisites: ENGL 130W or equivalent; senior standing.

CIVL 595W Capstone Design Project (W) 3.0 FS GW W  
 Prerequisites: Completion of GE Written Communication (A2) requirement; junior standing.  
 Corequisites: CIVL 558C, CIVL 561C, CIVL 562C, CIVL 571C, CIVL 575C, or CIVL 586C.

**1 course selected from:**

MATH 314 Probability and Statistics for Science and Technology 4.0 FS  
 Prerequisite: MATH 121; and one of the following: CINS 110, CSCI 111, MATH 130 (may be taken concurrently), or MATH 230.

MATH 350 Introduction to Probability and Statistics 3.0 FS  
 Prerequisites: MATH 121.

**2 courses selected from:**

~~CIVL 331 Environmental Engineering Chemistry~~  ~~3.0 FA -~~

~~Prerequisite: CIVL 231.~~

~~CIVL 413 Advanced Structures~~ - ~~3.0 SP -~~

~~Prerequisite: CIVL 313.~~

~~CIVL 415 Reinforced Concrete Design - 4.0 FA -~~

~~Prerequisites: CIVL 313. Recommended: CIVL 411.~~

~~CIVL 431 Water and Wastewater Engineering  4.0 SP -~~

~~Prerequisites: CIVL 231 or faculty permission; junior standing.~~

**1 course selected from:**

MECH 320 Dynamics 3.0 FS

Prerequisites: CIVL 211 with a grade of C- or higher, MATH 260.

MECH 332 Thermodynamics 3.0 FS

Prerequisites: PHYS 204A.

**~~1 course selected from:~~**

~~CIVL 558C Earthquake and Wind Engineering—Capstone - 3.0 INQ -~~

~~Prerequisite: CIVL 415, CIVL 554, or CIVL 556.~~

~~Corequisite: CIVL 595W.~~

~~CIVL 561C Hydrology and Open Channel Hydraulics—Capstone  3.0 FS -~~

~~Prerequisite: CIVL 461.~~

~~Corequisite: CIVL 595W.~~

~~CIVL 562C Groundwater Hydrology—Capstone  3.0 INQ -~~

~~Prerequisite: CIVL 461.~~

~~Corequisite: CIVL 595W.~~

~~CIVL 571C Natural Systems for Wastewater Treatment—Capstone  3.0 F1 -~~

~~Prerequisite: CIVL 431.~~

~~Corequisite: CIVL 595W.~~

~~CIVL 575C Solid and Hazardous Waste Management—Capstone  3.0 INQ -~~

~~Prerequisite: CIVL 431 or faculty permission.~~

~~Corequisite: CIVL 595W.~~






~~CIVL 586C Advanced Transportation Engineering Design—Capstone - 3.0 SP -~~

~~Prerequisite: CIVL 441.~~

~~Corequisite: CIVL 595W.~~

~~Students who take the capstone version of a course cannot also receive credit for the non-capstone version of the course.~~

**6 3 units selected from:**

CIVL 551	Foundations Engineering		3.0	INQ
Prerequisites: CIVL 411, CIVL 415 (may be taken concurrently).				
CIVL 554	Steel Design		3.0	INQ
Prerequisite: CIVL 313.				
CIVL 556	Timber Design		3.0	INQ
Prerequisites: CIVL 313.				
CIVL 556H	Timber Design - Honors		3.0	INQ
Prerequisites: CIVL 313.				
CIVL 558	Earthquake and Wind Engineering		3.0	INQ
Prerequisite: CIVL 415, CIVL 554, or CIVL 556.				
CIVL 558H	Earthquake and Wind Engineering - Honors		3.0	INQ
Prerequisites: CIVL 313, MATH 260. Recommended: Concurrent enrollment in or prior completion of CIVL 415, CIVL 554, CIVL 556.				
CIVL 561	Hydrology and Open Channels Hydraulics		3.0	INQ
Prerequisites: CIVL 461.				
CIVL 562	Groundwater Hydrology		3.0	INQ
Prerequisites: CIVL 461.				
<b>CIVL 564</b>	<b>Spatial Hydrology</b>		<b>3.0</b>	<b>INQ</b>
<b>Prerequisites: CIVL 461.</b>				
CIVL 567	Pipeline Hydraulics and Design		3.0	INQ
Prerequisites: CIVL 302W, CIVL 461.				
CIVL 571	Natural Systems for Wastewater Treatment		3.0	F1
Prerequisites: CIVL 431 or faculty permission.				
CIVL 573	Water Quality and Contaminant Transport		3.0	INQ
Prerequisites: CIVL 231 or CIVL 431.				
CIVL 575	Solid and Hazardous Waste Management		3.0	INQ



Prerequisites: CIVL 431 or faculty permission.

CIVL 586 Advanced Transportation Engineering Design 3.0 SP

Prerequisite: CIVL 441.

CIVL 592 Construction Engineering and Management 3.0 INQ

Prerequisites: CIVL 302W (may be taken concurrently), CIVL 411.

CIVL 598 Advanced Special Topics 1.0 -3.0 FS

Prerequisites: To be established when courses are formulated.

CIVL 599 Special Problems 1.0 -3.0 INQ

Prerequisites: Faculty permission.

### **3 units selected from:**

Other technical courses chosen from a list approved by the department.

## **Major Option Course Requirements: 12-14 units**

The following courses, or their approved transfer equivalents, are required dependent upon the option chosen. Students must select one of the following options for completion of the major course requirements. Use the links below to jump to your chosen option.

- [The Option in General Civil Engineering](#)
- [The Option in Environmental and Water Resources Engineering](#)
- [The Option in Structural Engineering](#)

## **The Option in General Civil Engineering: 12-14 units**

### **2 courses selected from:**

CIVL 331 Environmental Engineering Chemistry  3.0 FA

Prerequisite: CIVL 231.

CIVL 413 Advanced Structures 3.0 SP

Prerequisite: CIVL 313.

CIVL 415 Reinforced Concrete Design 4.0 FA

Prerequisites: CIVL 313. Recommended: CIVL 411.

CIVL 431 Water and Wastewater Engineering  4.0 SP

Prerequisites: CIVL 231 or faculty permission; junior standing.

CIVL 554 Steel Design 3.0 INQ

Prerequisite: CIVL 313.

CIVL 556 Timber Design 3.0 INQ

Prerequisites: CIVL 313.

**1 course selected from:**

CIVL 558C Earthquake and Wind Engineering - Capstone 3.0 INQ

Prerequisite: CIVL 415, CIVL 554, or CIVL 556.

Corequisite: CIVL 595W.

CIVL 561C Hydrology and Open Channel Hydraulics Capstone  3.0 FS

Prerequisite: CIVL 461.

Corequisite: CIVL 595W.

CIVL 562C Groundwater Hydrology - Capstone  3.0 INQ

Prerequisite: CIVL 461.

Corequisite: CIVL 595W.

CIVL 564C Spatial Hydrology - Capstone  3.0 INQ

Prerequisite: CIVL 461.

Corequisite: CIVL 595W.

CIVL 571C Natural Systems for Wastewater Treatment - Capstone  3.0 F1

Prerequisite: CIVL 431.

Corequisite: CIVL 595W.

CIVL 575C Solid and Hazardous Waste Management - Capstone  3.0 INQ

Prerequisite: CIVL 431 or faculty permission.

Corequisite: CIVL 595W.

CIVL 586C Advanced Transportation Engineering Design - Capstone 3.0 SP

Prerequisite: CIVL 441.

Corequisite: CIVL 595W.

Students who take the capstone version of a course cannot also receive credit for the non-capstone version of the course.

**3 units selected from:**

CIVL 551	Foundations Engineering		3.0	INQ
Prerequisites: CIVL 411, CIVL 415 (may be taken concurrently).				
CIVL 554	Steel Design		3.0	INQ
Prerequisite: CIVL 313.				
CIVL 556	Timber Design		3.0	INQ
Prerequisites: CIVL 313.				
CIVL 556H	Timber Design - Honors		3.0	INQ
Prerequisites: CIVL 313.				
CIVL 558	Earthquake and Wind Engineering		3.0	INQ
Prerequisite: CIVL 415, CIVL 554, or CIVL 556.				
CIVL 558H	Earthquake and Wind Engineering - Honors		3.0	INQ
Prerequisites: CIVL 313, MATH 260. Recommended: Concurrent enrollment in or prior completion of CIVL 415, CIVL 554, CIVL 556.				
CIVL 561	Hydrology and Open Channels Hydraulics		3.0	INQ
Prerequisites: CIVL 461.				
CIVL 562	Groundwater Hydrology		3.0	INQ
Prerequisites: CIVL 461.				
CIVL 564	Spatial Hydrology		3.0	INQ
Prerequisites: CIVL 461.				
CIVL 567	Pipeline Hydraulics and Design		3.0	INQ
Prerequisites: CIVL 302W, CIVL 461.				
CIVL 571	Natural Systems for Wastewater Treatment		3.0	F1
Prerequisites: CIVL 431 or faculty permission.				
CIVL 573	Water Quality and Contaminant Transport		3.0	INQ
Prerequisites: CIVL 231 or CIVL 431.				
CIVL 575	Solid and Hazardous Waste Management		3.0	INQ
Prerequisites: CIVL 431 or faculty permission.				
CIVL 586	Advanced Transportation Engineering Design		3.0	SP

Prerequisite: CIVL 441.

CIVL 592 Construction Engineering and Management 3.0 INQ

Prerequisites: CIVL 302W (may be taken concurrently), CIVL 411.

CIVL 598 Advanced Special Topics 1.0 -3.0 FS

Prerequisites: To be established when courses are formulated.

CIVL 599 Special Problems 1.0 -3.0 INQ

Prerequisites: Faculty permission.

## The Option in Environmental and Water Resources Engineering: 13 units

### 2 courses required:

CIVL 331 Environmental Engineering Chemistry  3.0 FA

Prerequisite: CIVL 231.

CIVL 431 Water and Wastewater Engineering  4.0 SP

Prerequisites: CIVL 231 or faculty permission; junior standing.

### 1 course selected from:

CIVL 561C Hydrology and Open Channel Hydraulics Capstone  3.0 FS


Prerequisite: CIVL 461.

Corequisite: CIVL 595W.

CIVL 562C Groundwater Hydrology - Capstone  3.0 INQ

Prerequisite: CIVL 461.

Corequisite: CIVL 595W.

CIVL 564C Spatial Hydrology - Capstone  3.0 INQ

Prerequisite: CIVL 461.

Corequisite: CIVL 595W.

CIVL 571C Natural Systems for Wastewater Treatment - Capstone  3.0 F1

Prerequisite: CIVL 431.

Corequisite: CIVL 595W.

CIVL 575C Solid and Hazardous Waste Management - Capstone  3.0 INQ

Prerequisite: CIVL 431 or faculty permission.

Corequisite: CIVL 595W.

Students who take the capstone version of a course cannot also receive credit for the non-capstone version of the course.

**3 units selected from:**

CIVL 561 Hydrology and Open Channels Hydraulics  3.0 INQ

Prerequisites: CIVL 461.

CIVL 562 Groundwater Hydrology  3.0 INQ

Prerequisites: CIVL 461.

CIVL 564 Spatial Hydrology  3.0 INQ

Prerequisites: CIVL 461.

CIVL 567 Pipeline Hydraulics and Design 3.0 INQ

Prerequisites: CIVL 302W, CIVL 461.

CIVL 571 Natural Systems for Wastewater Treatment  3.0 F1

Prerequisites: CIVL 431 or faculty permission.

CIVL 573 Water Quality and Contaminant Transport 3.0 INQ

Prerequisites: CIVL 231 or CIVL 431.

CIVL 575 Solid and Hazardous Waste Management  3.0 INQ

Prerequisites: CIVL 431 or faculty permission.

**The Option in Structural Engineering: 13 units**

**2 courses required:**

CIVL 415	Reinforced Concrete Design	4.0 FA
Prerequisites: CIVL 313. Recommended: CIVL 411		
CIVL 558C	Earthquake and Wind Engineering - Capstone	3.0 INQ
Prerequisite: CIVL 415, CIVL 554, or CIVL 556.		
Corequisite: CIVL 595W.		

Students who take the capstone version of a course cannot also receive credit for the non-capstone version of the course.

**1 course selected from:**

CIVL 413	Advanced Structures	3.0 SP
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Prerequisite: CIVL 313.

CIVL 554	Steel Design	3.0 INQ
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Prerequisite: CIVL 313.

CIVL 556	Timber Design	3.0 INQ
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Prerequisites: CIVL 313.

**3 units selected from:**

CIVL 551	Foundations Engineering	3.0 INQ
Prerequisites: CIVL 411, CIVL 415 (may be taken concurrently).		

CIVL 554	Steel Design	3.0 INQ
Prerequisite: CIVL 313.		

CIVL 556	Timber Design	3.0 INQ
Prerequisites: CIVL 313.		

CIVL 556H	Timber Design - Honors	3.0 INQ
Prerequisites: CIVL 313.		

~~**3 units selected from:**~~

~~Other technical courses chosen from a list approved by the department.~~

**Advising Requirement:**

Advising is mandatory for all majors in this degree program. Consult your undergraduate advisor for specific information.

### **Honors in the Major:**

Honors in the Major is a program of independent work in your major. It requires 6 units of honors course work completed over two semesters.

The Honors in the Major program allows you to work closely with a faculty mentor in your area of interest on an original performance or research project. This year-long collaboration allows you to work in your field at a professional level and culminates in a public presentation of your work. Students sometimes take their projects beyond the University for submission in professional journals, presentation at conferences, or academic competition. Such experience is valuable for graduate school and professional life. Your honors work will be recognized at your graduation, on your permanent transcripts, and on your diploma. It is often accompanied by letters of commendation from your mentor in the department or the department chair.

Some common features of Honors in the Major program are:

- You must take 6 units of Honors in the Major course work. All 6 units are honors classes (marked by a suffix of H), and at least 3 of these units are independent study (399H, 499H, 599H) as specified by your department. You must complete each class with a minimum grade of B.
- You must have completed 9 units of upper-division course work or 21 overall units in your major before you can be admitted to Honors in the Major. Check the requirements for your major carefully, as there may be specific courses that must be included in these units.
- Your *cumulative* GPA should be at least 3.5 or within the top 5% of majors in your department.
- Your GPA *in your major* should be at least 3.5 or within the top 5% of majors in your department.
- Most students apply for or are invited to participate in Honors in the Major during the second semester of their junior year. Then they complete the 6 units of course work over the two semesters of their senior year.
- Your honors work culminates with a public presentation of your honors project.

While Honors in the Major is part of the Honors Program, each department administers its own program. Please contact your major department or major advisor to apply.

### **Honors in Civil Engineering**

The common elements of the Honors in the Major program listed above apply to Honors in Civil Engineering. Specific information for this program includes:

1. In addition to meeting the GPA requirements, you must be recommended by a faculty member.

2. Students who are admitted into the department's Honors in the Major program may elect to take any two upper-division civil engineering electives for honors credit. The honors section will be identified on your transcript. The courses are usually spread over two semesters. You must complete them with a minimum grade of B and maintain a minimum GPA of 3.0 overall.

3. Each Honors in the Major class will require completion of the course plus an additional honors project and culminates with a public presentation of your honors project.



## California State University Chico

### Major: Civil Engineering (BS): Environmental and Water Resources Engineering

Catalog Year: Current

Degree Units: 128

\*This student is remediated in Math and English  
 \*This student took 4 years of high school language other than English

Semester 1		Semester 2		<b>Comments</b>  It is recommended that you meet with your major advisor early in your academic career and every semester.  Manipulate and create your own semester by semester plan using your Smart Planner in your Portal.  Review your Degree Progress Report (DPR) in your Student Center, meet with your Major Department Advisor for major coursework, and meet with an Academic Advisor in SSC 220 to review General Education and Graduation requirements.  Consider meeting the United States Diversity and Global Cultures requirements within GE courses.  University Writing Requirement: You must complete a GE Written Communication (A2) course with a grade of C- or higher, and a Graduation Writing Assessment Requirement (GW) course in your major with a grade of C- or higher. In addition you must complete 2 additional Writing (W) courses, see your DPR for specific writing course options.  Select any Upper-Division Pathway. Select 2 courses from the same Pathway; one course from the Humanities Discipline and the other from the Social Science Discipline.  Apply to graduate one year before anticipated graduation date. Priority registration is guaranteed your final semester if you applied for graduation by the stated deadline.
CIVL 175 (GE Area B2)	3	CIVL 140	3	
CIVL 101	1	CHEM 111 (GE Area B1)	4	
CIVL 130	3	MATH 121	4	
MATH 120 (GE Area A4)	4	PHYS 204A	4	
ENGL 130W or JOUR 130W (GE Area A2)	3	HIST 130 or POLS 155	3	
<b>Total Units</b>	<b>14</b>	<b>Total Units</b>	<b>18</b>	
Semester 3		Semester 4		
MATH 314 or MATH 350	3	MECH 208 or CIVL 205	2	
CIVL 212 or MECH 210	3	CIVL 311	4	
PHYS 204B	4	Science Selection (BIO 211, CHEM 112, GEOS 102, PHYS 204C)	3	
CIVL 211	3	MATH 260	4	
CMST 131 (GE Area A1)	3	CIVL 231	3	
<b>Total Units</b>	<b>16</b>	<b>Total Units</b>	<b>16</b>	
Semester 5		Semester 6		
CIVL 313	3	CIVL 302W	3	
CIVL 321	4	CIVL 461	3	
CIVL 331	3	GE Area F Course	3	
GE Area C Course	3	CIVL 411	4	
HIST 130 or POLS 155	3	CIVL 431	4	
<b>Total Units</b>	<b>16</b>	<b>Total Units</b>	<b>17</b>	
Semester 7		Semester 8		
MECH 320 or MECH 332	3	CE Capstone - CIVL 56#C or 57#C	3	
CIVL 441	4	CIVL 595	3	
CIVL 495 (GE Area E)	3	CE Technical Elective	3	
CE: Upper Division Selection	3	CIVL 56# or 57#	3	
GE Upper Division Pathway	3	GE Upper Division Pathway	3	
<b>Total Units</b>	<b>16</b>	<b>Total Units</b>	<b>15</b>	

**Meriam Library**  
**California State University, Chico**

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**MEMORANDUM**

**To: Steffen Mehl**

**From: Jodi Shepherd**

**Date: May 21, 2021**

**Subject: Library materials support for the proposed program changes in Civil Engineering**

The Meriam Library currently holds over 6,000 print titles and 2,400 ebooks in the subject of Civil Engineering. The library also subscribes to 41 journals in the subject of Civil Engineering. Databases which cover research in the area of Civil Engineering include:

- Compendex
- ASCE Library
- Science Direct
- Academic Search
- Green File
- ABI/INFORM Global and Trade & Industry
- SpringerLink
- Wiley Online Library
- Business Source Premier

There maybe a need to subscribe to Environmental Engineering specific databases such as OnePetro, or Environmental Engineering Abstracts if research by students and faculty increases in the Environmental Engineering field. Additional funding would ne to be secured if this subject becomes more prolific at CSU, Chico.

As it stands now, the library will be able to support the proposed changes outlined in the proposal.

**From:** [Steffen W Mehl](#)  
**To:** [Todd J Greene](#)  
**Cc:** [Nicol Gray](#)  
**Subject:** RE: FW: Proposal for degree options in Environmental and Water Resources Engineering  
**Date:** Friday, September 17, 2021 1:19:19 PM

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Hi Todd

Thanks for the support. We can definitely include GEOS 353.  
-Steffen

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**From:** Todd J Greene  
**Sent:** Friday, September 17, 2021 8:36 AM  
**To:** Steffen W Mehl <[smehl@csuchico.edu](mailto:smehl@csuchico.edu)>  
**Subject:** Re: FW: Proposal for degree options in Environmental and Water Resources Engineering

Yes. The GEOS Dept is in full support of this new Option. We welcome any CIVL students into our courses for their Technical Elective course as well with the updated list we talked about earlier. Please include GEOS 353 (Environmental Fluid Mechanics) as well on that list.

Good luck with the process.

Todd Greene  
GEOS, Chair

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**From:** Steffen W Mehl <[smehl@csuchico.edu](mailto:smehl@csuchico.edu)>  
**Sent:** Friday, September 17, 2021 8:11 AM  
**To:** Todd J Greene <[tjgreene@csuchico.edu](mailto:tjgreene@csuchico.edu)>  
**Subject:** Re: FW: Proposal for degree options in Environmental and Water Resources Engineering

Hi Todd

Any feedback on this from your faculty?  
Thanks.  
-Steffen-

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**From:** Todd J Greene <[tjgreene@csuchico.edu](mailto:tjgreene@csuchico.edu)>  
**Sent:** Tuesday, September 14, 2021 2:37 PM  
**To:** Steffen W Mehl <[smehl@csuchico.edu](mailto:smehl@csuchico.edu)>  
**Subject:** RE: FW: Proposal for degree options in Environmental and Water Resources Engineering

Can you call me now? x5546

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**From:** Steffen W Mehl

**Sent:** Tuesday, September 14, 2021 2:37 PM  
**To:** Todd J Greene <[tjgreene@csuchico.edu](mailto:tjgreene@csuchico.edu)>  
**Subject:** Re: FW: Proposal for degree options in Environmental and Water Resources Engineering

Hi Todd

No worries. Yes, I need to have updated documents to Nicol by Sept. 17, so end of the week works fine.

-Steffen-

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**From:** Todd Greene <[tjgreene@csuchico.edu](mailto:tjgreene@csuchico.edu)>  
**Sent:** Tuesday, September 14, 2021 2:26 PM  
**To:** Steffen W Mehl <[smehl@csuchico.edu](mailto:smehl@csuchico.edu)>  
**Subject:** Fwd: FW: Proposal for degree options in Environmental and Water Resources Engineering

Yes, sorry about that. I need to run this by some folks here first. I should have a response by the end of the week if that's OK.

Todd

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**From:** Steffen W Mehl <[smehl@csuchico.edu](mailto:smehl@csuchico.edu)>  
**Sent:** Tuesday, September 14, 2021 2:02:28 PM (UTC-08:00) Pacific Time (US & Canada)  
**To:** Todd J Greene <[tjgreene@csuchico.edu](mailto:tjgreene@csuchico.edu)>  
**Subject:** Re: Proposal for degree options in Environmental and Water Resources Engineering

Hi Todd

Just following up on this. I know we chatted about it on Thursday and including some of the GEOS classes in the Technical Elective when we advise students in the enviro/water option is something we can easily incorporate, but it would be great to get your feedback in writing on this.

Thanks.

-Steffen-

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**From:** Steffen W Mehl  
**Sent:** Thursday, September 9, 2021 4:47 PM  
**To:** Todd J Greene <[tjgreene@csuchico.edu](mailto:tjgreene@csuchico.edu)>  
**Subject:** Proposal for degree options in Environmental and Water Resources Engineering

Hi Todd

It's been a while since we've talked curriculum, but the degree options within CIVL when to EPPC today and there was feedback about GEOS's perception of these options as one of them is "Environmental & Water Resources Engineering". (see attached). It's essentially grouping

together Jack's Env. Engr. Chem (CIVL 331) + Oakley's Water/Wastewater treatment (CIVL 431) + a 500-level elective in water or enviro + capstone elective in water or enviro.

I'd be happy to discuss with you as you like.

Be well.

-Steffen-

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Todd J. Greene

Professor

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