California State University Chico
Office of the President

Executive Memorandum 22-002

February 3, 2022

From: Gayle E. Hutchinson, President

Subject: Approval of the New Option in Structural 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 Structural 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.

Policy Title:	EM 22-002 New Option in Structural Engineering within the BS in Civil Engineering
Contact:	Department of Civil Engineering
Supersedes:	
Revision:	
Enabling Legislation or Executive Order:	

The California State University
OFFICE OF THE CHANCELLOR

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:

Degree	Degree/CIP Code	Options	Option/CIP Code
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 13:48 PST)

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

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: Structural 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

Steffen Mehl — 3/25/2021

Chair, Department Curriculum Committee — Date

Steffen Mehl — 3/25/2021

Department Chair — Date

The College of ECC
has reviewed and approved this new program

Clarke Steinback
Clarke Steinback (Mar 26, 2021 13:22 PDT) — Mar 26, 2021

Chair, College Curriculum Committee — Date

Blake Wentz
Blake Wentz (Mar 26, 2021 14:49 PDT) — Mar 26, 2021

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. *Structural 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. Structural engineering is a subset of civil engineering. In California, seismic activity is a primary consideration for structural design. Previous building codes adopted a philosophy of designing buildings stiff and strong enough such that they would not fall during an earthquake. New research has shown that a better strategy is to design building such that they will be functional after an earthquake (that is, limit the damage and loss). This practice is more sustainable in that buildings can be functional sooner rather than having to be torn down and rebuilt (in the old designs, despite not collapsing during an earthquake, the building itself was damaged enough to make it non- functional and would have to scrapped). It is important that the next generation of civil engineers understand how to design better buildings and structures with resiliency in mind.
    .
    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, none offer a degree option in structural engineering. This option would be unique to the CSU system. Sacramento, Northridge, Pomona, and San Diego offer an MS in structural engineering*
        2. Identify neighboring institutions with the proposed option. *None. UC Davis has an MS specialization in Structural Engineering.*
        3. Identify differences, if any, between these programs and the proposed program. *Our program would be at the undergraduate level, rather than a graduate 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. *Timber and Steel Design (structural engineering courses) have some of our largest enrollments of any electives.*
2. Estimated number of students seeking the option
   a. in the year of initiation. *15*
   b. after three years. *20*
   c. after five years. *25*
   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. *15*
   c. after five years. *25*
   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. *Structural 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 structural 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 structural area. Key features are:*

- Take CIVL 415 – Reinforced Concrete Design (4)

- Select 1 course from:

CIVL 413 – Advanced Structures (3)
CIVL 554 – Steel Design (3)
CIVL 556 – Timber Design (3)

- Take capstone elective CIVL 558C – Earthquake & Wind Engineering (3)

- Select 1 engineering elective from (cannot be double counted):

CIVL 551 – Foundations Engineering (3)
CIVL 554 – Steel Design (3)
CIVL 556 – Timber Design (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 though 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 degree requirements. A minimum of 39 units, including those required for the major, must be upper division.

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. 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.			
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.

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
Prerequisite: CIVL 313.

CIVL 554 Steel Design 3.0 INQ
Prerequisite: CIVL 313.

CIVL 556 Timber Design 3.0 INQ
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.

Civil Engineering (BS) - 000020183

California State University Chico

Major: Civil Engineering (BS): Structural Engineering

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

Catalog Year: Current

Degree Units: 128

Semester 1	
CIVL 175 (GE Area B2)	3
CIVL 101	1
CIVL 130	3
MATH 120 (GE Area A4)	4
ENGL 130W or JOUR 130W (GE Area A2)	3
Total Units	**14**

Semester 2	
CIVL 140	3
CHEM 111 (GE Area B1)	4
MATH 121	4
PHYS 204A	4
HIST 130 or POLS 155	3
Total Units	**18**

Comments
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 andGraduation 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.

Semester 3	
MATH 314 or MATH 350	3
CIVL 212 or MECH 210	3
PHYS 204B	4
CIVL 211	3
CMST 131 (GE Area A1)	3
Total Units	**16**

Semester 4	
MECH 208 or CIVL 205	2
CIVL 311	4
Science Selection (BIO 211, CHEM 112, GEOS 102, PHYS 204C)	3
MATH 260	4
CIVL 231	3
Total Units	**16**

Semester 5	
CIVL 313	3
CIVL 321	4
MECH 320 or MECH 332	3
GE Area C Course	3
HIST 130 or POLS 155	3
Total Units	**16**

Semester 6	
CIVL 302W	3
CIVL 461	3
GE Area F Course	3
CIVL 411	4
CIVL 413, 554, or 556	3
Total Units	**16**

Semester 7	
CIVL 415	4
CIVL 441	4
CIVL 495 (GE Area E)	3
CE: Upper Division Selection	3
GE Upper Division Pathway	3
Total Units	**17**

Semester 8	
CE Capstone - CIVL 558C	3
CIVL 595	3
CE Technical Elective	3
CIVL 551, 554, or 556	3
GE Upper Division Pathway	3
Total Units	**15**

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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.