

# BS IN CIVIL ENGINEERING

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**SACRAMENTO STATE**  
*Redefine the Possible*

## In Workflow

1. CE Committee Chair (j.garcia@csus.edu)
2. CE Chair (khan@csus.edu)
3. ECS College Committee Chair (abadi@csus.edu)
4. ECS Dean (arad@csus.edu)
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7. Dean of Undergraduate (gardner@csus.edu)
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9. Catalog Editor (catalog@csus.edu)
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## Approval Path

1. Sat, 09 Sep 2023 00:29:07 GMT  
Jose Garcia (j.garcia): Approved for CE Committee Chair
2. Fri, 15 Sep 2023 23:13:21 GMT  
Ghazan Khan (khan): Approved for CE Chair
3. Mon, 02 Oct 2023 16:58:22 GMT  
Masoud Ghodrat Abadi (abadi): Approved for ECS College Committee Chair
4. Mon, 02 Oct 2023 17:20:47 GMT  
Behnam Arad (arad): Approved for ECS Dean
5. Mon, 30 Oct 2023 23:01:06 GMT  
Katie Hawke (katedickson): Approved for Academic Services

## History

1. May 2, 2018 by clmig-jwehrheim
2. Mar 4, 2019 by Julie Fogarty (fogarty)
3. Apr 18, 2019 by Kaitlyn Ehrmantrout (k.ehrmantrout)
4. Feb 24, 2020 by Julie Fogarty (fogarty)
5. Apr 28, 2020 by 220267334
6. May 12, 2020 by Janett Torset (torsetj)
7. Mar 26, 2021 by Julie Fogarty (fogarty)
8. Apr 20, 2021 by 220267334
9. Aug 25, 2021 by Janett Torset (torsetj)
10. Jan 27, 2022 by Katie Hawke (katedickson)
11. Aug 4, 2022 by 302822325
12. Aug 10, 2022 by 302822325

Date Submitted: Fri, 08 Sep 2023 21:18:01 GMT

**Viewing: BS in Civil Engineering**

**Last approved: Wed, 10 Aug 2022 19:16:37 GMT**

**Last edit: Mon, 02 Oct 2023 16:57:53 GMT**

Changes proposed by: Julie Fogarty (218645519)

**Academic Group: (College)**

Engineering & Computer Science

**Academic Organization: (Department)**

Civil Engineering

**Catalog Year Effective:**

2024-2025 Catalog

**Individual(s) primarily responsible for drafting the proposed degree major program:**

Name (First Last)	Email	Phone 999-999-9999
Jose Garcia	jgarcia@csus.edu	9162784504

**Type of Program Proposal:**

Major

**Program Change Type:**

Non-Substantive

**Delivery Format:**

Fully Face to Face

**Title of the Program:**

BS in Civil Engineering

**Designation: (degree terminology)**

Bachelor of Science

**Briefly describe the program proposal (new or change) and provide a justification:**

Multiple electives were updated from experimental courses to permanent courses last year and have been added to the official list of electives that count towards the degree requirements.

The list of electives was moved to a separate table to make the semester-by-semester plan clearer to students. The electives were also rearranged so it was very clear which courses are design electives.

**University Learning Goals**

**Undergraduate Learning Goals:**

- Competence in the disciplines
- Knowledge of human cultures and the physical and natural world
- Intellectual and practical skills
- Personal and social responsibility
- Integrative learning

**Program Learning Outcomes**

**Program Learning Outcomes**

**Learning Outcome**

- 1) Ethically apply their hands-on, practice-oriented civil engineering education to succeed professionally;
- 2) Engage in lifelong learning through graduate education, professional development, and/or active involvement in professional organizations; and
- 3) Communicate effectively on multi-disciplinary teams to address diverse challenges, creating solutions that serve the general public.

**Will this program be required as part of a teaching credential program, a single subject, or multiple subject waiver program (e.g., Liberal Studies, Biology) or other school personnel preparation program (e.g., School of Nursing)?**

No

**Do these changes impact the Smart Planner roadmap?**

No

**Catalog Description:**

Units required for Major: 94 including GE courses

Total units required for BS: 124

## Program Description

Civil Engineering involves the application of scientific principles and knowledge of mathematics and computers to the planning, analysis, design, and construction of all types of private and public works. Reduction of air and water pollution, disposal of hazardous wastes, renewal of our old cities, planning and building of new communities, providing water, power, and high-speed ground transportation systems are the responsibilities of the civil engineer. It is a continual challenge to the civil engineer to provide these services efficiently by the construction of dams, buildings, bridges, tunnels, highways, airports, waterways, and waste handling facilities in harmony with the natural environment.

Because of the broad range of demands on the civil engineer's services, the undergraduate program is devoted to fundamental principles in mathematics; basic and engineering sciences; the spectrum of Civil Engineering practice in both analysis and design; and required courses in the humanities and the social sciences, so that engineers may better relate to the world and society they serve. The upper division program permits students to select 12 units (4 courses) of electives. Students may increase the breadth or depth of their knowledge in Civil Engineering by selecting these electives in several areas: environmental and water quality engineering, geotechnical engineering, structural engineering, transportation, and water resources engineering.

Courses may be interchanged between semesters to accommodate the student's schedule, as long as prerequisites are observed. Civil engineering is a demanding major, but with devoted study it can be completed in four years. Students who are working half-time or more often find it difficult to successfully pass a full load of classes each semester. Such students should plan to take fewer units per semester and a longer time to finish their degree.

**Note:** Students must satisfy the requirements of the Accreditation Board for Engineering and Technology (EAC/ABET). Consult the Civil Engineering Department Chair for specific General Education requirements.

**Note:** Students graduating with a BS in Civil Engineering will not be subject to the University's Foreign Language Graduation Requirement. Students who change major may be subject to the University's Foreign Language Graduation Requirement.

As defined by policy <http://www.csus.edu/umannual/acadaff/fsm00010.htm>, a change in units constitutes a substantive change to the program. If your changes constitute a substantive change, please refer back to the "Program Change Type" field above to ensure that "Substantive" is selected.

**Program Requirements: (If new courses are being created as part of a new program, it will be useful to propose courses first.)**

## Program Requirements

Code	Title	Units
<b>Required Lower Division Courses (65 Units)</b>		
<i>First Semester Freshman Year</i>		
CE 1	Civil Engineering Seminar	1
CE 4	Engineering Graphics and CAD <sup>1</sup>	2
CHEM 1E	General Chemistry for Engineering <sup>1</sup>	4
MATH 30	Calculus I <sup>1</sup>	4
Select two General Education courses		6
<i>Second Semester Freshman Year</i>		
CE 9	Plane and Topographic Surveying	2
CE 9L	Plane and Topographic Surveying Laboratory	1
MATH 31	Calculus II <sup>1</sup>	4
PHYS 11A	General Physics: Mechanics <sup>1</sup>	4
Select two General Education courses		6
<i>First Semester Sophomore Year</i>		
ENGR 45	Engineering Materials	3
MATH 45	Differential Equations for Science and Engineering	3
PHYS 11C	General Physics: Electricity and Magnetism <sup>1</sup>	4
Select two General Education courses		6
<i>Second Semester Sophomore Year</i>		
ENGL 20	College Composition II	3
ENGR 30	Analytic Mechanics: Statics	3
MATH 35 or MATH 100	Introduction to Linear Algebra Applied Linear Algebra	3
Select two General Education courses		6
<b>Required Upper Division Courses (59 Units) <sup>2</sup></b>		
<i>First Semester Junior Year</i>		
CE 101	Computer Applications in Civil Engineering	3
ENGR 110	Analytic Mechanics - Dynamics	3
ENGR 112	Mechanics Of Materials	3

ENGR 115	Statistics For Engineers	3
ENGR 132	Fluid Mechanics	3
<i>Second Semester Junior Year</i>		
CE 100	Engineering Geology	2
CE 130	Water Resources Engineering	3
CE 130L	Hydraulics Laboratory	1
CE 150	Principles of Environmental Engineering	2
CE 150L	Environmental Engineering Laboratory	1
CE 160	Introduction to Structural Analysis <sup>1</sup>	3
Select General Education course		3
<i>First Semester Senior Year</i>		
CE 140	Transportation Engineering	3
CE 140L	Transportation Engineering Laboratory	1
CE 151	Environmental Engineering Practice	2
CE 170	Soil Mechanics	3
CE 170L	Soil Mechanics Laboratory	1
Select one Civil Engineering elective <sup>3</sup>		3
CE 190	Civil Engineering Project Skills	3
<i>Second Semester Senior Year</i>		
CE 160L	Structural Laboratory <sup>1</sup>	1
CE 191	Senior Project	3
Select three Civil Engineering electives <sup>3</sup>		9
<b>Total Units</b>		<b>124</b>

### Civil Engineering Electives

Code	Title	Units
Select at least two design electives from the following: <sup>4</sup>		
<i>Design Electives</i>		
CE 133	Design of Urban Water and Sewer Systems	
CE 134	Open Channel Hydraulics	
CE 141	Traffic Analysis and Design	
CE 144	Geometric Design of Highways	
CE 152 Stormwater Management		
CE 153	Design of Water Quality Control Processes	
CE 163	Structural Steel Design	
CE 164	Reinforced Concrete Design	
CE 165	Masonry Design	
CE 168	Prestressed Concrete Design	
CE 169	Timber Design	
CE 171	Soil Mechanics and Foundation Engineering	
CE 175	Geotechnical Earthquake Engineering	
<i>Technical Electives</i>		
CE 131	Hydrology	
CE 132	Groundwater Engineering	
CE 142	Transportation Systems	
CE 156	Geoenvironmental Engineering	
CE 166	Seismic Behavior of Structures	
CE 182	Introduction to GIS in Civil Engineering	
CE 183	Concrete Technology	
ENGR 124	Thermodynamics	

<sup>1</sup> Course also satisfies General Education (GE)/Graduation Requirement.

<sup>2</sup> Students must normally complete all lower division preparation before enrolling in upper division Engineering or Civil Engineering courses.

<sup>3</sup> At least two Civil Engineering electives must be design courses (indicated by <sup>5</sup>).

<sup>4</sup> Electives are to be chosen from these courses in consultation with a faculty advisor and must include at least two design electives (indicated by <sup>5</sup>).

**Note:** Other electives, such as a CE 196 series course or CE 199E may be chosen with the approval of a faculty advisor and Department Chair.

## General Education Requirements <sup>1</sup>

Code	Title	Units
<b>Area A: Basic Subjects (6 Units)</b>		
A1	Oral Communication	3
A2	Written Communication	3
A3	Critical Thinking	0
<b>Area B: Physical Universe and Its Life Forms (3 Units)</b>		
B1	Physical Science <sup>2</sup>	0
B2	Life Forms	3
B3	Lab (Note: Lab experience to be taken with one of the following: B1, B2 or B5) <sup>2</sup>	0
B4	Math Concepts <sup>2</sup>	0
B5	Additional Course (Any B to reach 12 units) - Take upper-division course to complete Area & upper division requirements. <sup>2</sup>	0
<b>Area C: Arts and Humanities (12 Units)</b>		
C1	Arts	3
C2	Humanities	3
C1/C2	Area Course C	3
C1/C2	Area C Course - Take upper-division course to complete Area & upper division requirements.	3
<b>Area D: The Individual and Society (6 Units)</b>		
	Area D Course	3
	Area D Course	3
	Area D Course - Take upper-division course to complete Area & upper division requirements. <sup>2</sup>	0
<b>Area E: Understanding Personal Development</b>		
	Area E Course <sup>2</sup>	0
<b>Area F: Ethnic Studies (3 Units)</b>		
	Area F Course	3
<b>Total Units</b>		<b>30</b>

<sup>1</sup> To help you complete your degree in a timely manner and not take more units than absolutely necessary, there are ways to use single courses to meet more than one requirement (overlap). For further information, please visit the General Education page (<http://catalog.csus.edu/colleges/academic-affairs/general-education/>).

**Note:** There is no way to list all possible overlaps so please consult with a professional advisor. The Academic Advising Center can be visited online (<http://www.csus.edu/acad/>), by phone (916) 278-1000, or email ([advising@csus.edu](mailto:advising@csus.edu)).

<sup>2</sup> Required in Major; also satisfies GE.

## Graduation Requirements <sup>1</sup>

Code	Title	Units
<b>Graduation Requirements (required by CSU) (9 Units)</b>		
	American Institutions: U.S. History	3
	American Institutions: U.S. Constitution & CA Government	3
	Writing Intensive (WI)	3
<b>Graduation Requirements (required by Sacramento State) (3 Units)</b>		
	English Composition II <sup>2</sup>	0
	Race and Ethnicity in American Society (RE)	3
	Foreign Language Proficiency Requirement <sup>3</sup>	0

<sup>1</sup> To help you complete your degree in a timely manner and not take more units than absolutely necessary, there are ways to use single courses to meet more than one requirement (overlap). For further information, please visit the General Education page (<http://catalog.csus.edu/colleges/academic-affairs/general-education/>).

**Note:** There is no way to list all possible overlaps so please consult with a professional advisor. The Academic Advising Center can be visited online (<http://www.csus.edu/acad/>), by phone (916) 278-1000, or email ([advising@csus.edu](mailto:advising@csus.edu)).

<sup>2</sup> Required in Major; also satisfies Graduation Requirement.

<sup>3</sup> If not satisfied before entering Sacramento State, it may be satisfied in General Education Area C2 (Humanities). "C- or better required." The alternative methods for satisfying the Foreign Language Proficiency Requirement are described here: <https://www.csus.edu/college/arts-letters/world-languages-literatures/foreign-language-requirement.html>

**Note:** Students with a declared major of BS in Civil Engineering are exempt from the Foreign Language Graduation Requirement.

### **Fiscal Impact to Change an Existing Program**

**Indicate programmatic or fiscal impact which this change will have on other academic units' programs, and describe the consultation that has occurred with affected units:**

NA

**Provide a fiscal analysis of the proposed changes:**

NA

**How will the above changes be accommodated within the department/College existing fiscal resources?**

Courses already taught by existing full-time and part-time faculty as experimental courses.

**Will the proposed changes require additional resources?**

No

**What additional space, equipment, operating expenses, library, computer, or media resources, clerical/technical support, or other resources will be needed?**

NA

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