

# BS IN CIVIL ENGINEERING



**SACRAMENTO STATE**  
Redefine the Possible

## In Workflow

1. CE Committee Chair (fogarty@csus.edu)
2. CE Chair (fellb@csus.edu)
3. ECS College Committee Chair (figgess@csus.edu)
4. ECS Dean (kevan@csus.edu)
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7. Dean of Undergraduate (james.german@csus.edu;%20celena.showers@csus.edu)
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9. Catalog Editor (torsetj@csus.edu)
10. Registrar's Office (w lindsey@csus.edu)

## Approval Path

1. Thu, 17 Sep 2020 23:04:37 GMT  
Julie Fogarty (fogarty): Approved for CE Committee Chair
2. Fri, 18 Sep 2020 15:28:19 GMT  
Benjamin Fell (fellb): Approved for CE Chair
3. Fri, 16 Oct 2020 17:56:57 GMT  
Gareth Figgess (figgess): Approved for ECS College Committee Chair
4. Fri, 16 Oct 2020 17:57:19 GMT  
Kevan Shafizadeh (kevan): Approved for ECS Dean

## History

1. May 2, 2018 by clmig-jwehrheim
2. Mar 4, 2019 by Julie Fogarty (fogarty)
3. Apr 18, 2019 by 212408496
4. Feb 24, 2020 by Julie Fogarty (fogarty)
5. Apr 28, 2020 by Celena Showers (celena.showers)
6. May 12, 2020 by Janett Torset (torsetj)

Date Submitted: Thu, 17 Sep 2020 23:04:11 GMT

## Viewing: BS in Civil Engineering

**Last approved: Tue, 12 May 2020 22:02:04 GMT**

**Last edit: Fri, 02 Oct 2020 17:12:47 GMT**

Changes proposed by: Julie Fogarty (218645519)

### Academic Group: (College)

Engineering & Computer Science

### Academic Organization: (Department)

Civil Engineering

### Catalog Year Effective:

2021-2022 Catalog

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

Name (First Last)	Email	Phone 999-999-9999
Ben Fell	fellb@csus.edu	916-278-8139

**Type of Program Proposal:**

Major

**Program Change Type:**

Non-Substantive

**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:**

This program change is just the final step in renumbering the undergraduate civil engineering BS program to create clearer advising for students. A handful of courses are being renumbered as course numbers that were currently being used and could not be submitted as their final number last year. The following courses are updated (only number changes - no changes to course description, ELOs, assessment):

CE 190A is now CE 190

CE 150B is now CE 151

CE 170C is now CE 170

The design course superscripts disappeared on several electives after the last catalog change when their course number changed. The designations are reinstated and consistent with the 2018 catalog.

**Objectives of the degree program:**

Program educational objectives are broad statements that describe what graduates are expected to attain within a few years of graduation. The objectives of this program are to prepare graduates to --

- 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.

## University Learning Goals

**Undergraduate Learning Goals:**

Competence in the disciplines

Knowledge of human cultures and the physical and natural world

Integrative learning

Personal and social responsibility

Intellectual and practical skills

**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?**

Yes

**Please attach the Smart Planner roadmap:**

CE Roadmap Fall 2020.docx

**Briefly describe the change:**

Number changes on CE 190A, CE 150B, CE 151, and CE 170C.

**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	Introduction to Linear Algebra	3
or MATH 100	Applied Linear Algebra	
Select two General Education courses		6
<b>Required Upper Division Courses (57 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	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		
CE 170	Soil Mechanics	3
CE 170L	Soil Mechanics Laboratory	1
CE 190	Civil Engineering Project Skills <sup>1</sup>	3
Select Civil Engineering elective <sup>3</sup>		3
<i>Second Semester Senior Year</i>		
CE 160L	Structural Laboratory	1
CE 191	Senior Project	3
Select three Civil Engineering electives <sup>3</sup>		9
<b>Civil Engineering Electives</b>		
Select from the following: <sup>4</sup>		
CE 131	Hydrology	
CE 132	Groundwater Engineering	
CE 133	Design of Urban Water and Sewer Systems <sup>5</sup>	
CE 134	Open Channel Hydraulics <sup>5</sup>	
CE 141	Traffic Analysis and Design	
CE 142	Transportation Systems	
CE 153	Design of Water Quality Control Processes <sup>5</sup>	
CE 156	Geoenvironmental Engineering	
CE 163	Structural Steel Design <sup>5</sup>	
CE 164	Reinforced Concrete Design <sup>5</sup>	
CE 165	Masonry Design <sup>5</sup>	
CE 166	Seismic Behavior of Structures	
CE 168	Prestressed Concrete Design <sup>5</sup>	
CE 169	Timber Design <sup>5</sup>	
CE 171	Soil Mechanics and Foundation Engineering <sup>5</sup>	
CE 175	Geotechnical Earthquake Engineering <sup>5</sup>	
CE 182	Introduction to GIS in Civil Engineering	
ENGR 124	Thermodynamics	

Total Units 122

- <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.
- <sup>5</sup> Indicates a design elective.

## 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 (9 Units)</b>	
Area D Course	3
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>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/>).

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<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:

N/A

Provide a fiscal analysis of the proposed changes:

N/A

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

N?A

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?**

N/A

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