

BS IN CIVIL ENGINEERING

In Workflow

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Approval Path

1. Sat, 12 Oct 2019 03:21:29 GMT
Julie Fogarty (fogarty): Approved for CE Committee Chair
2. Mon, 14 Oct 2019 17:59:38 GMT
Benjamin Fell (fellb): Approved for CE Chair
3. Fri, 25 Oct 2019 16:30:49 GMT
Troy Topping (troy.topping): Approved for ECS College Committee Chair
4. Fri, 25 Oct 2019 16:52:29 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

Date Submitted: Sat, 12 Oct 2019 02:59:21 GMT

Viewing: BS in Civil Engineering

Last approved: Thu, 18 Apr 2019 17:22:55 GMT

Last edit: Fri, 25 Oct 2019 14:42:59 GMT

Changes proposed by: Julie Fogarty (218645519)

Academic Group: (College)

Engineering & Computer Science

Academic Organization: (Department)

Civil Engineering

Catalog Year Effective:

2020-2021 Catalog

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

Name (First Last)	Email	Phone 999-999-9999
Benjamin 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:

Units for the program are remaining unchanged. Three things are happening for the reasons below:

- 1) Combined lab and lecture courses are being split into their components
- 2) Courses are being renumbered
- 3) Experimental elective is becoming permanent elective after being offered twice (CE 132)

There are high DFW rates for many of the combined CE lecture/lab courses. This leads to delayed graduation since repeating students need to be accommodated and those seeking to take the course for the first time are prevented from enrolling in the limited laboratory seats.

The proposed program change includes separating the civil engineering lab and lecture experiences to:

- 1) open up the limited lab seats available for students first attempting the course;
- 2) enable students who have failed the combined lab/lecture courses to better spend their time on the lecture content when repeating the course if they have already successfully completed the lab activities

At the same time, undergraduate CE courses are being renumbered to clarify course pre- and co-requisites and topic areas to help students plan their path to graduation.

Please see the attached documents for a summary of all the Form A changes as well as a side by side of the Form B to clarify the number changes and lab/lecture splits.

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.docx

Briefly describe the change:

Changes to Sem. 2, 6, 7, and 8. Lecture/labs separated. All courses renumbered to updated numbering scheme.

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
Required Lower Division Courses (65 Units)		
<i>First Semester Freshman Year</i>		
CE 1A	Civil Engineering Seminar ¹	1
CE 4	Engineering Graphics and CAD ¹	2
CHEM 1E	General Chemistry for Engineering ¹	4
MATH 30	Calculus I ¹	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 ¹	4
PHYS 11A	General Physics: Mechanics ¹	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 ¹	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
Required Upper Division Courses (59 Units)²		
<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 132	Fluid Mechanics	3
ENGR 115	Statistics For Engineers	3
<i>Second Semester Junior Year</i>		
CE 100	Engineering Geology	2
CE 137	Water Resources Engineering	3
CE 135	Hydraulics Laboratory	1
CE 161	Introduction to Structural Analysis ¹	3

CE 170A	Principles of Environmental Engineering	2
CE 150L	Environmental Engineering Laboratory	1
Select General Education course		3
<i>First Semester Senior Year</i>		
CE 147	Transportation Engineering	3
CE 140L	Transportation Engineering Laboratory	1
CE 170B	Environmental Engineering Practice	2
CE 171A	Soil Mechanics	3
CE 170L	Soil Mechanics Laboratory	1
CE 190A	Civil Engineering Project Skills ¹	3
Select Civil Engineering elective ³		3
<i>Second Semester Senior Year</i>		
CE 113	Structural Laboratory ¹	1
CE 190B	Senior Project	3
Select three Civil Engineering electives ³		9
Civil Engineering Electives		
Select from the following: ⁴		
CE 132	Groundwater Engineering	
CE 138	Hydrology	
CE 139	Open Channel Hydraulics ⁵	
CE 148	Transportation Systems	
CE 149	Traffic Analysis and Design ⁵	
CE 151	Introduction to GIS in Civil Engineering	
CE 163	Structural Steel Design ⁵	
CE 164	Reinforced Concrete Design ⁵	
CE 166	Seismic Behavior of Structures	
CE 168	Prestressed Concrete Design ⁵	
CE 169A	Timber Design ⁵	
CE 169B	Reinforced Masonry Design ⁵	
CE 171B	Soil Mechanics and Foundation Engineering ⁵	
CE 172	Design of Urban Water and Sewer Systems ⁵	
CE 173	Design of Water Quality Control Processes ⁵	
CE 181	Geoenvironmental Engineering	
CE 184	Geotechnical Earthquake Engineering ⁵	
ENGR 124	Thermodynamics	

Total Units 124

- ¹ Course also satisfies General Education (GE)/Graduation Requirement.
- ² Students must normally complete all lower division preparation before enrolling in upper division Engineering or Civil Engineering courses.
- ³ At least two Civil Engineering electives must be design courses (indicated by⁵).
- ⁴ Electives are to be chosen from these courses in consultation with a faculty advisor and must include at least two design electives (indicated by⁵).
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.
- ⁵ Indicates a design elective.

General Education Requirements ¹

Code	Title	Units
Area A: Basic Subjects (6 Units)		
A1	Oral Communication	3
A2	Written Communication	3
A3	Critical Thinking	0
Area B: Physical Universe and Its Life Forms (3 Units)		
B1	Physical Science ²	0
B2	Life Forms	3
B3	Lab (Note: Lab experience to be taken with one of the following: B1, B2 or B5) ²	0
B4	Math Concepts ²	0

B5 - Additional Course (Any B to reach 12 units) - Take upper-division course to complete Area & upper division requirements.² 0

Area C: Arts and Humanities (12 Units)

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

Area D: The Individual and Society (9 Units)

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.² 0

Area E: Understanding Personal Development

Area E Course² 0

Total Units 30

¹ 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).

² Required in Major; also satisfies GE.

Graduation Requirements ¹

Code	Title	Units
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Graduation Requirements (required by CSU) (9 Units)

American Institutions: U.S. History		3
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American Institutions: U.S. Constitution & CA Government		3
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Writing Intensive (WI)		3
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Graduation Requirements (required by Sacramento State) (3 Units)

English Composition II ²		0
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Race and Ethnicity in American Society (RE)		3
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Foreign Language Proficiency Requirement ³		0
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¹ 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).

² Required in Major; also satisfies Graduation Requirement.

³ 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/wll/flgr/>

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:

No fiscal impact due to program change.

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

Estimate the cost and indicate how these resource needs will be accommodated:

N/A

Please attach any additional files not requested above:

CE Curriculum Change Description Form B 2019-2020.docx
2019-10-10 BS Form B Side by Side.docx

Key: 152