SACRAMENTO STATE

Attachment E
Faculty Senate Meeting - April 12, 2012

Program Proposal
Form B

Academic Group *(College)*: Engineering and Computer Science	**Date of Submission to College Dean:** February 24, 2012
Academic Organization *(Department)*: Civil Engineering	**Requested Effective: Fall_x__, Spring___, 20_12__.**
Department Chair: Ramzi Mahmood	**Contact if not Department Chair:**
Title of the Program *(Please be specific; indicate minor, undergraduate or graduate degree, etc.)*: B.S. in Civil Engineering	

Type of Program Proposal:

____x___ Modification in Existing Program:
- **__x_ Substantive Change**
- **___ Non-Substantive Change**
- **___ Deletion of Existing Program**

_____ New Programs
- **___ Initiation (Projection) of New Program on to Master Plan**
- **___ New Degree Programs**
  - **___Regular Process**
  - **___Fast Track Process**
  - **___Pilot Process**
- **___ New Minor, Concentration, Option, Specialization, Emphasis**
- **___ New Certificate Program**

PLEASE NOTE: **Form B is to be used only as a Cover Form. Additional information is requested for each of the above as noted in the corresponding procedure in the Policies and Procedures for Initiation, Modification, Review and Approval of Courses and Academic Programs found at http://www.csus.edu/umanual/acad.htm**

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

The first three changes proposed here are motivated by requests from the University to reduce the number of units in the major.

Delete Engr 17 (Circuits). This class has been maintained primarily to assist students in passing the Fundamentals of Engineering (FE) state examination. Focus groups of alumni consistently cite it as a course that has had no practical value for them after graduation. Students are exposed to basic circuits concepts in Physic 11C and in review courses for the FE exam.

Remove CE 164 (Reinforced Concrete) from the list of required classes; keep it as an elective. This is the first step in a process to revise the role of electives in the major. After this change, the core of the major will consist of five 4-unit class/lab combinations, one for each subdiscipline of civil engineering.

Change the number of design units required in electives from 3 to 6. Six are needed to meet accreditation standards. CE 164 represents 3 design units taken out of the required class list. Accordingly, the number of design units in the electives list must increase by 3.

Total unit reduction = 6

There are other editorial changes to the catalog copy attached. These are required by the change in prerequisites for CE 146 and ENGR 140. (Form A's for these changes are part of this package.)

Approvals:

Department Chair: _____ **Date:** 2/24/2012

College Dean: _____ **Date:** 2/24/12

University Committee: _____ **Date:** 3/27/12

Associate Vice ~~President and~~ Dean for Academic Affairs: _____ **Date:** 3/27/12

09/10/2008

Catalog copy

EXISTING	PROPOSED
Requirements - Bachelor of Science Degree	**Requirements - Bachelor of Science Degree**
~~Units required for Pre-Major: 46 plus GE courses~~	Units required for Pre-Major: 43 plus GE courses
~~Units required for Major: 60 plus GE courses~~	Units required for Major: 57 plus GE courses
~~Minimum total units for the BS: 138~~	Minimum total units for the BS: 132
NOTE: Additional units may be required to meet the Sacramento State foreign language requirement.	**NOTE:** Additional units may be required to meet the Sacramento State foreign language requirement.
Courses in parentheses are prerequisites.	*Courses in parentheses are prerequisites.*
A. Required Lower Division Courses (Pre-Major)	**A. Required Lower Division Courses (Pre-Major)**
First Semester Freshman Year (17 units)	**First Semester Freshman Year (17 units)**
(2) CE 4 Engineering Graphics and CAD	(2) CE 4 Engineering Graphics and CAD
(5) CHEM 1A* General Chemistry I (High school chemistry and college algebra; sufficient performance on the college algebra diagnostic test, or equivalent)	(5) CHEM 1A* General Chemistry I (High school chemistry and college algebra; sufficient performance on the college algebra diagnostic test, or equivalent)
(4) MATH 30* Calculus I (MATH 29 or four years of high school mathematics which includes two years of algebra, one year of geometry, and one year of mathematical analysis; completion of ELM requirement and Pre-Calculus Diagnostic Test)	(4) MATH 30* Calculus I (MATH 29 or four years of high school mathematics which includes two years of algebra, one year of geometry, and one year of mathematical analysis; completion of ELM requirement and Pre-Calculus Diagnostic Test)
(3) General Education course	(3) General Education course
(3) General Education course	(3) General Education course
Second Semester Freshman Year (18 units)	**Second Semester Freshman Year (18 units)**
(1) CE 1A Civil Engineering Seminar	(1) CE 1A Civil Engineering Seminar
(3) CE 9 Plane and Topographic Surveying (MATH 26A or MATH 30; may be taken concurrently)	(3) CE 9 Plane and Topographic Surveying (MATH 26A or MATH 30; may be taken concurrently)
(4) MATH 31* Calculus II (MATH 30 or appropriate high school based AP credit)	(4) MATH 31* Calculus II (MATH 30 or appropriate high school based AP credit)
(4) PHYS 11A* General Physics: Mechanics (MATH 30, MATH 31 or equivalent certificated high school courses. MATH 31 may be taken concurrently)	(4) PHYS 11A* General Physics: Mechanics (MATH 30, MATH 31 or equivalent certificated high school courses. MATH 31 may be taken concurrently)

(3) General Education course

(3) General Education course

First Semester Sophomore Year (19 units)

(3) ENGR 45 Engineering Materials (CHEM 1A and MATH 30)

(3) MATH 45 Differential Equations for Science and Engineering (MATH 31)

(4) PHYS 11C* General Physics: Electricity and Magnetism, Modern Physics (MATH 31, PHYS 11A)

(3) General Education course

(3) General Education course

(3) General Education course

~~**Second Semester Sophomore Year (19 units)**~~

(3) ENGL 20 College Composition II (ENGL 1A or ENGL 2 or equivalent with a grade "C-" or better, sophomore standing must have completed 30 units prior to registration)

~~(3) ENGR 17 Introductory Circuit Analysis (PHYS 11C, MATH 45; either the math or physics may be taken concurrently, but not both)~~

(3) ENGR 30 Analytic Mechanics: Statics (PHYS 11A, MATH 31 and CE 4 or ENGR 6)

(4) MATH 32 Calculus III (MATH 31)

(3) General Education course

(3) General Education course

*Indicates course which can also be used to meet University General Education requirements.

B. Required Upper Division Courses (Major)

Students must normally complete all lower division preparation before enrolling in upper division Engineering or Civil Engineering courses.

First Semester Junior Year (16 units)

(2) CE 100 Engineering Geology (ENGR 112; may be taken concurrently)

(3) General Education course

(3) General Education course

First Semester Sophomore Year (19 units)

(3) ENGR 45 Engineering Materials (CHEM 1A and MATH 30)

(3) MATH 45 Differential Equations for Science and Engineering (MATH 31)

(4) PHYS 11C* General Physics: Electricity and Magnetism, Modern Physics (MATH 31, PHYS 11A)

(3) General Education course

(3) General Education course

(3) General Education course

Second Semester Sophomore Year (16 units)

(3) ENGL 20 College Composition II (ENGL 1A or ENGL 2 or equivalent with a grade "C-" or better, sophomore standing must have completed 30 units prior to registration)

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(3) ENGR 30 Analytic Mechanics: Statics (PHYS 11A, MATH 31 and CE 4 or ENGR 6)

(4) MATH 32 Calculus III (MATH 31)

(3) General Education course

(3) General Education course

*Indicates course which can also be used to meet University General Education requirements.

B. Required Upper Division Courses (Major)

Students must normally complete all lower division preparation before enrolling in upper division Engineering or Civil Engineering courses.

First Semester Junior Year (16 units)

(2) CE 100 Engineering Geology (ENGR 112; may be taken concurrently)

(3) CE 101 Computer Applications in Civil Engineering (CE 4, ENGR 30)

~~(3) CE 146 Civil Engineering Professional Practice (CE 1A, ENGR 30; CE 1A may be taken concurrently)~~

(3) ENGR 110 Analytic Mechanics: Dynamics (ENGR 30, MATH 32, MATH 45)

(3) ENGR 112 Mechanics of Materials (ENGR 30, ENGR 45, MATH 45)

(2) ENGR 115 Statistics for Engineers (MATH 31, may be taken concurrently)

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Second Semester Junior Year (16 units)

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(1) CE 113 Structural Laboratory (ENGR 112, CE 101)

(3) CE 161 Theory of Structures I (CE 1A, CE 101, CE 146, ENGR 112, MATH 32; CE 146 may be taken concurrently)

(4) CE 171A Soil Mechanics (CE 1A, CE 100, CE 101, CE 146, ENGR 112; CE 146 may be taken concurrently)

(3) ENGR 132 Fluid Mechanics (ENGR 110)

~~(2) ENGR 140 Engineering Economics (ENGR 17, ENGR 30, or instructor permission)~~

~~(3) General Education course~~

First Semester Senior Year (17 units)

(3) CE 137 Water Resources Engineering (CE 1A, CE 101, CE 146, ENGR 115, ENGR 132, ENGR 140; CE 146 may be taken concurrently)

(4) CE 147 Transportation Engineering (CE 1A, CE 9, CE 101, CE 146, ENGR 115, GWAR certification before Fall 09, or WPJ score of 70+, or at least a C- in ENGL ENGL 109M/W; CE

(3) CE 101 Computer Applications in Civil Engineering (CE 4, ENGR 30)

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(3) ENGR 110 Analytic Mechanics: Dynamics (ENGR 30, MATH 32, MATH 45)

(3) ENGR 112 Mechanics of Materials (ENGR 30, ENGR 45, MATH 45)

(2) ENGR 115 Statistics for Engineers (MATH 31, may be taken concurrently)

(3) General Education course

Second Semester Junior Year (16 units)

(3) CE 146 Civil Engineering Professional Practice (CE 1A, ENGR 30, ENGL109 (or a minimum score of 70 on the WPJ exam); CE 1A may be taken concurrently)

(1) CE 113 Structural Laboratory (ENGR 112, CE 101)

(3) CE 161 Theory of Structures I (CE 1A, CE 101, CE 146, ENGR 112, MATH 32; CE 146 may be taken concurrently)

(4) CE 171A Soil Mechanics (CE 1A, CE 100, CE 101, CE 146, ENGR 112; CE 146 may be taken concurrently)

(3) ENGR 132 Fluid Mechanics (ENGR 110)

(2) ENGR 140 Engineering Economics (ENGR 17 or ENGR 30)

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First Semester Senior Year (17 units)

(3) CE 137 Water Resources Engineering (CE 1A, CE 101, CE 146, ENGR 115, ENGR 132, ENGR 140; CE 146 may be taken concurrently)

(4) CE 147 Transportation Engineering (CE 1A, CE 9, CE 101, CE 146, ENGR 115, GWAR certification before Fall 09, or WPJ score of 70+,

146 may be taken concurrently)

~~(3) CE 164 Reinforced Concrete Design (CE 161, CE 113; CE 113 may be taken concurrently)~~

(4) CE 170 Principles of Environmental Engineering (CE 1A, CE 101, CE 146, ENGR 115; GWAR certification before Fall 09, or WPJ score of 70+, or at least a C- in ENGL ENGL 109M/W; CE 146 may be taken concurrently)

(3) ENGR 124 Thermodynamics (MATH 32, PHYS 11A, CHEM 1A)

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~~**Second Semester Senior Year (16 units)**~~

(1) CE 135 Hydraulics Laboratory (CE 101, CE 137, GWAR certification before Fall 09, or WPJ score of 70+, or at least a C- in ENGL ENGL 109M/W; CE 137 may be taken concurrently)

(3) CE 190 Senior Project (To be taken in final semester or instructor permission)

(3) CE elective+

(3) CE elective+

~~(3) CE elective+~~

(3) General Education course

~~+ One CE elective is restricted to a design course.~~

C. Civil Engineering Electives

Electives are to be chosen from the following courses in consultation with a faculty advisor and must include at least one design elective (indicated by°).

CE 138 Hydrology (CE 137)

CE 139° Open Channel Hydraulics (CE 137)

CE 148 Transportation Systems (CE 147, ENGR 140; GWAR certification before Fall 09, or WPJ score of 70+, or at least a C- in ENGL ENGL 109M/W or instructor permission)

CE 162 Theory of Structures II (CE 161)

or at least a C- in ENGL ENGL 109M/W; CE 146 may be taken concurrently)

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(4) CE 170 Principles of Environmental Engineering (CE 1A, CE 101, CE 146, ENGR 115; GWAR certification before Fall 09, or WPJ score of 70+, or at least a C- in ENGL ENGL 109M/W; CE 146 may be taken concurrently)

(3) ENGR 124 Thermodynamics (MATH 32, PHYS 11A, CHEM 1A)

(3) CE elective+

Second Semester Senior Year (13 units)

(1) CE 135 Hydraulics Laboratory (CE 101, CE 137, GWAR certification before Fall 09, or WPJ score of 70+, or at least a C- in ENGL ENGL 109M/W; CE 137 may be taken concurrently)

(3) CE 190 Senior Project (To be taken in final semester or instructor permission)

(3) CE elective+

(3) CE elective+

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(3) General Education course

+ At least two CE electives must be design courses (indicated by °).

C. Civil Engineering Electives

Electives are to be chosen from the following courses in consultation with a faculty advisor and must include at least one design elective (indicated by °).

CE 138 Hydrology (CE 137)

CE 139° Open Channel Hydraulics (CE 137)

CE 148 Transportation Systems (CE 147, ENGR 140; GWAR certification before Fall 09, or WPJ score of 70+, or at least a C- in ENGL ENGL 109M/W or instructor permission)

CE 162 Theory of Structures II (CE 161)

CE 163° Structural Design in Steel I (CE 161)

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CE 165° Structural Design in Steel II (CE 163)

CE 166 Seismic Behavior of Structures (CE 101, CE 161; ENGR 110)

CE 168° Pre-stressed Concrete Design (CE 161, CE 164; CE 164 may be taken concurrently)

CE 169A° Timber Design (CE 161)

CE 169B° Reinforced Masonry Design (CE 161)

CE 171B° Soil Mechanics and Foundation Engineering (CE 171A)

CE 172° Design of Urban Water and Sewer Systems (CE 137)

CE 173° Design of Water Quality Control Processes (CE 170, ENGR 132)

CE 181 Geoenvironmental Engineering (CE 171A or instructor permission)

CE 184 Introduction to Earthquake Engineering (CE 161, CE 171A)

° Indicates a design elective.

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.

CE 163° Structural Design in Steel I (CE 161)

CE 164° Reinforced Concrete Design (CE 161, CE 113; CE 113 may be taken concurrently)

CE 165° Structural Design in Steel II (CE 163)

CE 166 Seismic Behavior of Structures (CE 101, CE 161; ENGR 110)

CE 168° Pre-stressed Concrete Design (CE 161, CE 164; CE 164 may be taken concurrently)

CE 169A° Timber Design (CE 161)

CE 169B° Reinforced Masonry Design (CE 161)

CE 171B° Soil Mechanics and Foundation Engineering (CE 171A)

CE 172° Design of Urban Water and Sewer Systems (CE 137)

CE 173° Design of Water Quality Control Processes (CE 170, ENGR 132)

CE 181 Geoenvironmental Engineering (CE 171A or instructor permission)

CE 184 Introduction to Earthquake Engineering (CE 161, CE 171A)

° Indicates a design elective.

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.