BLENDED BS/MS IN CIVIL ENGINEERING

Total units required for Blended BS/MS: 145

Program Description

The Blended BS/MS program in Civil Engineering provides an accelerated route to a graduate professional degree, with simultaneous conferring of both Bachelor's and Master's degrees. Students in the blended program can progress from undergraduate to graduate status without applying for admission through the Office of Graduate Studies. Students are required to complete all requirements for both degrees, including senior project for the Bachelor's degree.

Admission Requirements

Students majoring in Civil Engineering will be eligible to apply to the program if they meet the following criteria:

- Have completed all lower-division work (including lower- division general education courses and American Institutions courses)
- Have a minimum GPA of 3.0.

Application Procedures

Students interested in applying to the Blended BS/MS Program should follow the following procedure:

- Students must complete the department application while in undergraduate status.
- Applicants do not need to pay the graduate program application fee.
- Electronic applications will be submitted to the CE Graduate Coordinator for review.
- Upon acceptance to the program, the department will notify the Registrar's Office and the Office of Graduate Studies.
- Upon completion of 120 units that count toward satisfying either the bachelor's or master's requirements in the blended program, the student will need to apply to change to graduate status.

Program of Study

The blended program allows students to double count up to 9 units of graduate level specialization courses both as electives for the B.S. degree (https://catalog.csus.edu/colleges/engineering-computer-science/engineering-civil/bs-in-civil-engineering/) and core courses for the M.S. degree (https://catalog.csus.edu/colleges/engineering-computer-science/engineering-civil/ms-in-civil-engineering/), effectively decreasing the summed unit requirements for both degrees.

Students in the blended program are required to select their two M.S. elective courses from the Civil Engineering Department with the approval of an advisor from their area of specialization or the graduate coordinator prior to enrolling in the courses.

Program Requirements

Total number of required units for the Blended BS/MS program in Civil Engineering is 145. Variable units are listed due to variable culminating requirement units.

Code	Title	Units
REQUIRED LOWER DIVISION COURSES (65 Units)		
First Semester First Year		
CE 1	Civil Engineering Seminar	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
Second Semester First Year		
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
First Semester Second Year		
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
Second Semester Second Year		
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
Required Upper Division and Graduate Level Courses (80 Units) [2]		
First Semester Third Year		
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
Second Semester Third Year		
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 [1]	3
Select one General Education Course		3
First Semester Fourth Year		
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
CE 190	Civil Engineering Project Skills	3
Select one MS Specialization Course [3]		3
Second Semester Fourth Year		
CE 160L	Structural Laboratory [1]	1
CE 191	Senior Project	3
Select one Civil Engineering Elective [3,4]		3

Select two MS Specialization Course [3]		6
Select one MS Elective [4]		3
First Semester Year Five		
CE 200	Civil Engineering Professional Writing	3
Select one MS Specialization Course		3
Select one of the following: [5]		3
ENGR 201	Engineering Analysis I	
ENGR 202	Engineering Analysis II	
ENGR 203	Engineering Statistics	
Second Semester Year Five		
Select one MS Specialization courses		3
Select up to one MS Elective course [4, 6]		0 - 3
Select one of the following CE 500 requirements: [6]		3 - 6

Plan A:

Master's Thesis (3 or 6 units) Approval by the faculty thesis advisor and by a second faculty or an expert in the area of study is required. The thesis must comply with University standards for format and is filed in the University Library. The Master's Thesis should be the written product of a systematic study of a significant problem. It identifies the problem, states the major assumptions, explains the significance of the undertaking, sets forth the sources for and methods of gathering information, analyze the data, and offers a conclusion or recommendation. The finished product evidences originality, critical and independent thinking, appropriate organization and format, and thorough documentation. The work should be associated with engineering research or innovation. No more than 3 units may be awarded for a topic directly related to a topic studied of CE 299. A public presentation is required.

Plan B:

Master's Project (3 or 6 units) Approval by the faculty thesis advisor and by a second faculty or an expert in the area of study is required. A Master's Project should be a significant undertaking appropriate to the engineering profession. It evidences originality and independent thinking, appropriate form and organization, and rationale. It is described and summarized in a written report that includes a discussion of the project's significance, objectives, methodology and a conclusion or recommendation. The work should be associated with practical engineering applications. The report must comply with University standards for format and will be filed in the University Library. No more than 3 units may be awarded for a topic directly related to a topic studied for CE 299. A public presentation is required.

Plan C:

Directed Study with Comprehensive Exam (3 units). Approval of one faculty member is required for Directed Study. The comprehensive examination is administered by a committee of three faculty members. A written report and a public presentation are required on the directed study. The format of the comprehensive examination can be written, oral, or both.

Total Units	**145**

1. Course also satisfies General Education (GE)/Graduation Requirement.
2. Students must complete all lower division preparation before applying for the Blended BS/MS in Civil Engineering
3. At least two of the four courses with this superscript must be design electives (denoted with superscript 7).
4. Electives should be chosen from the list of courses in consultation with a faculty advisor from the MS Specialization area.
5. With advisor approval. Students pursuing an emphasis in Environmental Engineering, Water Resource Engineering or Transportation Engineering must take ENGR 203. Students pursuing an emphasis in Structural Engineering must take ENGR 201 or ENGR 202.
6. Total required units for the MS degree is 30. Variable units are listed due to variable culminating requirement units. If 3 units of culminating requirement (CE 500) are selected, 6 units of MS electives are required, and vice versa.
7. Indicates a Design elective.

MS Specialization Courses

Units required: 15 – a minimum of 12 units must be taken from one of the following five areas of specialization. Up to 3 units can be satisfied by 200 level coursework (not including CE 299) outside the chosen area of specialization.

Code	Title	Units
Environmental Engineering		
CE 232	Groundwater Hydrology [7]	
CE 251	Environmental Quality Processes I	
CE 252	Environmental Quality Processes II	
CE 253	Environmental Quality Processes III	
CE 254	Water Quality Management	
CE 255	Transport of Chemicals in Soil Systems	
CE 281	Systems Analysis of Resources Development	
Geotechnical Engineering		
CE 270	Advanced Soil Mechanics and Foundation Engineering I [7]	
CE 271	Advanced Soil Mechanics and Foundation Engineering II [7]	
CE 272	Geotechnical Modeling	
CE 273	Ground Modification Engineering [7]	
CE 274	Soil Dynamics and Earthquake Engineering [7]	
CE 275	Geosynthetics [7]	
Structural Engineering		
CE 260	Matrix Structural Analysis	
CE 261	Finite Element Analysis	
CE 262	Nonlinear Structural Analysis	
CE 263	Advanced Steel Design [7]	
CE 264	Advanced Design in Reinforced Concrete [7]	
CE 266	Dynamics and Earthquake Response of Structures	
CE 267	Structural Systems for Buildings [7]	
CE 268	Pre-stressed Concrete Bridge Design [7]	
Transportation Engineering		
CE 241	Analysis and Control of Traffic Systems	
CE 242	Transportation Planning	
CE 243	Traffic Flow Theory	
CE 244	Advanced Transportation Facility Design [7]	
CE 245	Pavement Design [7]	
CE 275	Geosynthetics [7]	
Water Resources Engineering		
CE 230	Water Resources Planning [7]	
CE 231	Hydrometeorology [7]	

CE 232	Groundwater Hydrology [7]	
CE 234	Advanced Engineering Hydraulics	
CE 235	Hydrologic Modeling	
CE 281	Systems Analysis of Resources Development	

Civil Engineering Electives

Code	Title	Units
Design Electives		
CE 133	Design of Urban Water and Sewer Systems [7]	
CE 141	Traffic Analysis and Design [7]	
CE 144	Geometric Design of Highways [7]	
CE 134	Open Channel Hydraulics [7]	
CE 152	Stormwater Management [7]	
CE 153	Design of Water Quality Control Processes [7]	
CE 163	Structural Steel Design [7]	
CE 164	Reinforced Concrete Design [7]	
CE 165	Masonry Design [7]	
CE 168	Prestressed Concrete Design [7]	
CE 169	Timber Design [7]	
CE 171	Soil Mechanics and Foundation Engineering [7]	
CE 175	Geotechnical Earthquake Engineering [7]	
Technical Electives		
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	

MS Electives

Code	Title	Units
Environmental Engineering		
CE 133	Design of Urban Water and Sewer Systems [7]	
CE 152	Stormwater Management [7]	
CE 153	Design of Water Quality Control Processes [7]	
CE 156	Geoenvironmental Engineering	
Any Environmental Engineering Specialization Course		
Geotechnical Engineering		
CE 171	Soil Mechanics and Foundation Engineering [7]	
CE 175	Geotechnical Earthquake Engineering [7]	
Any 200 level Civil Engineering Course		
Structural Engineering		
CE 163	Structural Steel Design [7]	
CE 164	Reinforced Concrete Design [7]	
CE 165	Masonry Design [7]	
CE 169	Timber Design [7]	
Any Structural Engineering Specialization Course		
Transportation Engineering		
CE 141	Traffic Analysis and Design [7]	
CE 142	Transportation Systems	
CE 144	Geometric Design of Highways [7]	
CE 182	Introduction to GIS in Civil Engineering	
Any Transportation Engineering Specialization Course		
Water Resources Engineering		
CE 131	Hydrology	
CE 132	Groundwater Engineering [7]	
CE 133	Design of Urban Water and Sewer Systems [7]	
CE 134	Open Channel Hydraulics [7]	
Any Water Resources Engineering Specialization Course		

Opt-Out Option

Students who wish to opt out after completing all other B.S. major requirements except their CE electives may do so and the graduate specialization courses will count as the electives required in the regular undergraduate program. The total number of units required (124) for the B.S. degree will be the same as for students who are not in the blended program.