MS IN CIVIL ENGINEERING

In Workflow

1. CE Committee Chair (fogarty@csus.edu)
2. CE Chair (merayyan@csus.edu)
3. ECS College Committee Chair (tongren.zhu@csus.edu)
4. ECS Dean (arad@csus.edu)
5. Academic Services (catalog@csus.edu)
6. Senate Curriculum Subcommittee Chair (curriculum@csus.edu)
7. Dean of Graduate (s.storms@csus.edu)
8. Graduate Studies (jdsmall@csus.edu; mxiong@csus.edu)
9. Registrar's Office (k.mcfarland@csus.edu)

Approval Path

1. Fri, 23 May 2025 20:31:43 GMT
   Katie Dickson (katiedickson): Rollback to Initiator
2. 2026-02-04T20:40:06Z
   Zoi Dokou (zoi.dokou): Approved for CE Committee Chair
3. 2026-09-10T17:36:56Z
   Saad Merayyan (merayyan): Rollback to CE Committee Chair for CE Chair
4. 2026-09-11T17:40:22Z
   Julie Fogarty (fogarty): Approved for CE Committee Chair
5. 2026-09-11T17:44:03Z
   Saad Merayyan (merayyan): Approved for CE Chair
6. 2026-10-02T16:47:28Z
   Tongren Zhu (tongren.zhu): Approved for ECS College Committee Chair
7. 2026-10-02T17:51:15Z
   Behnam Arad (arad): Approved for ECS Dean

History

1. May 2, 2018 by clmig-jwehrheim
2. Oct 11, 2018 by 212408496
3. Dec 3, 2018 by Ben Fell (fellb)
4. Jan 18, 2022 by Julie Fogarty (fogarty)
5. Aug 4, 2022 by 302822325
6. Aug 10, 2022 by 302822325
7. Feb 20, 2023 by Ghazan Khan (khan)

Date Submitted: 2026-02-04T20:36:16Z

Viewing: MS in Civil Engineering

Last approved: Mon, 20 Feb 2023 19:15:33 GMT

Last edit: 2026-10-02T16:45:09Z

Changes proposed by: Zoi Dokou (223005510)

Academic Group: (College)

Engineering & Computer Science

Academic Organization: (Department)

Civil Engineering

Catalog Year Effective:
2026-2027 Catalog

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

Name (First Last)	Email	Phone 999-999-9999
Julie Fogarty	fogarty@csus.edu	(916) 278-7335

Program Snapshot

Type of Program:
Major

Program Change Type:
Non-Substantive

Title of the Program:
MS in Civil Engineering

Designation: (degree terminology)
Master of Science

Delivery Mode:
Fully Face to Face

Support Mode:
State Support

Please see the CSU/CIP Code Crosswalk: https://www.csus.edu/academic-affairs/curriculum-workflow/_internal/_documents/csu_codes_to_cip.pdf

TMC Templates: https://c-idsystem.org/transfer-efforts/

Establishment of a master's degree program should be preceded by a national professional accreditation of the corresponding bachelor's degree major program.

Will this program require accreditation?
No

Provide a clear, concise overview of the program proposal (new or change) and provide a justification. For NEW programs describe the purpose and focus of the program, identify the target student population(s), and highlight key strengths and distinguishing features of the program.
Proposed program changes are intended to increase enrollment in the MS degree overall (1 & 3) as well as increase enrollment in individual MS courses (2 & 3) to ensure we do not need to cancel offerings due to low enrollment. Some specialization areas are thriving and some are struggling, so requiring that students take additional CE graduate level elective courses will ensure overlap and additional enrollment in the less popular specialization areas that are still important areas of knowledge for practicing civil engineers.

1) Suspension of the GRE requirement. This change is anticipated to increase enrollment in the Graduate Program and follows similar trends at other universities.

2) Alter math course to be an optional elective depending on area of specialization. Want to provide students with flexibility and ensure they are receiving content that is relevant to their post-graduation career. In elective footnote, add sentence "No more than 6 units of courses taken outside of Civil Engineering (CE) may be taken." to ensure students can still take ENGR math course as well as one grad elective in a different relevant area (i.e., GEOL or PPA), but most students will need to enroll in offered CE courses, even those outside their area of specialization that are still relevant to their career (i.e., overlap between structural, transportation and geotechnical and overlap between environmental and water resources areas).

3) Keep existing Plan C option, but provide an alternative exam only Plan C option for student flexibility. Most of our graduate students are working full time in the civil engineering industry. Many of our students would benefit more from an additional course focused on civil engineering design than performing a directed study. Depending on their area of specialization and career aspirations, we want to provide them with the best possible education. This may also attract students who want to pursue a course-based MS, which are currently available at other local institutions.

4) Clarified requirement for minimum grade of B for GWI course.

5) Removed sentence "-- 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" since students will able to take more CE electives outside their area of specialization, we want to ensure that at least half of their degree is in their area of specialization.

University Learning Goals

Graduate (Masters) Learning Goals:

Disciplinary knowledge
Communication
Critical thinking/analysis
Information literacy
Professionalism
Intercultural/Global perspectives
Research (optional)

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

Curriculum Alignment and Assessment

Program Learning Outcomes

Provide measurable, program-specific learning outcomes that reflect the most important competencies students will demonstrate upon completion of the program. Programs are expected to assess and use PLOs for continuous improvement.

Program Learning Outcomes

Learning Outcome
1. Succeed in professional employment at their chosen specialty of environmental, geotechnical, structural, transportation, or water resources engineering.
2. Identify, analyze, and solve complex practical civil engineering problems in their chosen field of specialty.
3. Communicate effectively about technically complex engineering problems to peers, other professionals, decision makers, and the general public, in the conduct of their work.

Learning Outcomes Display

Course Code	PLO 1	PLO 2	PLO 3
CE 200			
CE 232			
CE 251			
CE 252			
CE 253			
CE 254			
CE 255			
CE 281			
CE 270			
CE 271			
CE 272			
CE 273			
CE 274			
CE 275			
CE 260			

CE 261			
CE 262			
CE 263			
CE 264			
CE 266			
CE 267			
CE 268			
CE 241			
CE 242			
CE 243			
CE 244			
CE 245			
CE 230			
CE 231			
CE 234			
CE 235			

Catalog Description (catalog copy):

Total units required for the MS: 30

Program Description

Civil Engineering encompasses a broad range of professional activities. The four years of undergraduate preparation for the Bachelor of Science degree are devoted to fundamental analytical principles and basic design applications. For technical competence in specialized areas and continued effectiveness on the job, graduate study is becoming increasingly necessary.

The Civil Engineering Department offers a graduate program of study leading to a Master of Science degree in Civil Engineering in the following areas of specialization:

- **Environmental Engineering** - analysis, design, and management of natural and engineered water systems including drinking water, wastewater, and stormwater; solid and hazardous waste management and regulations; air quality management and pollution control technologies;
- **Geotechnical Engineering -** properties and behavior of soil; seepage analysis with application to design of foundation, retaining structures, earth dams and slopes; soil improvement and ground stabilization; geosynthetics inclusions, soil dynamics, and earthquake engineering;
- **Structural Engineering -** advanced structural analysis methods; structural systems; advanced concrete and steel analysis and design applied to buildings and bridges; seismic analysis and design;
- **Transportation Engineering** - transportation engineering and planning, traffic flow theory, and system management applicable to all modes with emphasis on highway and multi modal transportation; interdisciplinary study with other areas of civil engineering as well as with non-engineering areas may also be arranged; and
- **Water Resources Engineering** - advanced hydraulics and hydrologic design and analysis of water systems, modeling of hydraulic and hydrologic water systems, hydrometeorology analysis, steady and non-steady analysis of groundwater movement of confined and unconfined aquifers, modeling of groundwater movement, and planning, management, and operation of water resource systems.

The MS in Civil Engineering consists of a choice of courses within a specialization, a choice of elective courses, a writing intensive course, and culminating requirements; all selected by the student and approved by an advisor.

Admission and Continuation Requirements (catalog copy): minimum GPA and prerequisites (if applicable), required coursework or preparation, portfolio, test scores, and/or letters of recommendation. For graduate programs: expectations for a relevant bachelor's degree (required or preferred disciplines, prerequisite knowledge, or equivalent experience), include evidence that program requirements conform to the minimum requirements for the culminating experience, as specified in Title 5 Section 40510 The Master's Degree and Section 40511 The Doctoral Degree.

Admission Requirements

Admission as a classified graduate student in Civil Engineering requires:

- an undergraduate degree in Civil Engineering; and
- a minimum 2.8 GPA.

In addition, the merit of past academic endeavor and/or professional experience, potential for future study, and professional goals may also be considered for granting admission through submission of the civil engineering department supplemental application form.

Applicants who have deficiencies in admission requirements that can be removed by specified additional preparation may be admitted with conditionally classified graduate status.

Students with a baccalaureate degree in engineering majors other than Civil Engineering (e.g., Electrical and Electronic, Industrial, Mechanical, or Surveying) or in other non-engineering scientific disciplines (e.g., Mathematics, Physics, or Geology) who wish to pursue the graduate program in Civil Engineering may be considered on an individual basis. Such students may be admitted as conditionally classified students and will be required to complete a specifically designed list of undergraduate prerequisite courses in engineering and/or mathematics, physics, and chemistry to correct undergraduate deficiencies. Such a student must have an approved study program on file with the Department while undertaking this qualifying work. Upon completion of these courses with a GPA of 2.8 or better, the student may apply for classified graduate status in Civil Engineering.

Admission Procedures

All prospective graduate students, including Sacramento State graduates, must submit:

- an online application for admission; and
- one set of official transcript from all colleges and universities attended, *other than Sacramento State*.
- Civil Engineering department supplemental application form included in the online application.

For more admissions information and application deadlines, please visit the Office of Graduate Studies website *(*http://csus.edu/gradstudies/*)*.

After being admitted, students must meet with an advisor and complete a Graduate Student Advising Form (obtainable in the Civil Engineering Department). This advising form must be kept current and on file in the Department Office.

Minimum Units and Grade Requirements for the Degree

Total units Required for the MS: 30

Minimum Cumulative GPA: 3.0. No course in the program of study may have a grade below "C+". Students must earn a grade of B or higher in the required Graduate Writing Intensive (GWI) course.

Advancement to Candidacy

Each student must file an application for Advancement to Candidacy, indicating a proposed program of graduate study. This procedure should begin as soon as the graduate student has:

- removed any deficiencies in admission requirements;
- obtained classified graduate status;
- completed at least 12 units in the graduate program with a minimum 3.0 GPA, including at least three courses at the 200-level;
- taken the Graduate Writing Intensive (GWI) course in the degree program within the first two semesters of coursework at California State University, Sacramento; and
- selected and obtained approval for a culminating requirement (Plan A, B, or C).

Advancement to Candidacy form is submitted online. The student fills out the form after planning a degree program in consultation with their faculty advisor. The completed form is then approved by the Graduate Coordinator of the Department and submitted to the Office of Graduate Studies. Any subsequent deviations from an approved Advancement to Candidacy form would require the submission of a petition for exception form.

All graduate degree programs are subject to general University requirements for graduate degrees, explained in the *Graduate Degree Requirements* section of this catalog.

Program Requirements (catalog copy):

Program Requirements

Total number of required units for degree is 30. Variable units are listed due to variable culminating requirement units.

Code	Title	Units
Specialization Courses		
15 units are required as outlined in the Specialization Courses section below		15
Writing		
CE 200	Civil Engineering Professional Writing	3
Elective Courses		
Select 6 to 12 units of electives [1,2]		6 - 12
Culminating Requirement		
Select one of the following CE 500 requirements: [2]		0 - 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

Comprehensive Exam with Directed Study (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. This option is available to all specialization areas.

Comprehensive Exam without Directed Study (0 units). The comprehensive examination is administered by a committee of three faculty members. The format of the comprehensive examination can be written, oral, or both. This option is only available to students specializing in structural or geotechnical engineering and students must complete another elective to reach 30 units for the MS degree.

1 Elective courses (including CE 299) selected with prior approval of the student's faculty advisor in the area of interest. In addition to 200-level courses, these may also include the electives (but not the required courses) from the civil engineering undergraduate curriculum. No more than 6 units of courses may be taken outside of Civil Engineering (CE). No more than 3 units of CE 299 may be taken without prior approval of the Graduate Coordinator.

2 Total required units for degree is 30. Variable units are listed due to variable culminating requirement units. If 6 units of culminating requirement are selected, 6 units of electives are required. If 3 units of culminating requirement are selected, 9 units of electives are required. Only students pursuing an emphasis in Structural or Geotechnical Engineering may pursue a zero-unit Plan C option with advisor approval and will be required to take 12 units of electives.

Specialization Courses

Units required: 15

Code	Title	Units
Environmental Engineering		
Select from the following:		
CE 232	Groundwater Hydrology	
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		
Select from the following:		
CE 270	Advanced Soil Mechanics and Foundation Engineering I	
CE 271	Advanced Soil Mechanics and Foundation Engineering II	
CE 272	Geotechnical Modeling	
CE 273	Ground Modification Engineering	
CE 274	Soil Dynamics and Earthquake Engineering	
CE 275	Geosynthetics	
Structural Engineering		
Select from the following:		
CE 260	Matrix Structural Analysis	
CE 261	Finite Element Analysis	
CE 262	Nonlinear Structural Analysis	
CE 263	Advanced Steel Design	

CE 264	Advanced Design in Reinforced Concrete
CE 266	Dynamics and Earthquake Response of Structures
CE 267	Structural Systems for Buildings
CE 268	Pre-stressed Concrete Bridge Design
Transportation Engineering	
Select from the following:	
CE 241	Analysis and Control of Traffic Systems
CE 242	Transportation Planning
CE 243	Traffic Flow Theory
CE 244	Advanced Transportation Facility Design
CE 245	Pavement Design
CE 275	Geosynthetics
Water Resources Engineering	
Select from the following:	
CE 230	Water Resources Planning
CE 231	Hydrometeorology
CE 232	Groundwater Hydrology
CE 234	Advanced Engineering Hydraulics
CE 235	Hydrologic Modeling
CE 281	Systems Analysis of Resources Development

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:

Removal of ENGR 201/202 as required courses may impact Mechanical Engineering workloads if students opt to take a CE course instead. ME Chair has been consulted as seen in attached.

Attach a copy of correspondence with these units:

MEConsultation.pdf

Provide a fiscal analysis of the proposed changes:

The change is the suspension of the GRE requirement for students that hold degrees that are not ABET accredited and for student that do not meet the 2.8 GPA requirement. This change is anticipated to increase enrollment in the Graduate Program and follows similar trend in other Universities.

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

The graduate program enrollment has been decreasing in recent years, thus increase in enrollment would be easily accommodated by the Department and will have a positive impact on the program.

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?

None

Reviewer Comments:

Katie Dickson (katiedickson) (Fri, 23 May 2025 20:31:43 GMT): Rollback: In preparation for the summer 2025 Curriculum Workflow software update, all course and program proposals have been moved out of Workflow. Submissions to Workflow will resume Monday, August 11, 2025. Please contact Academic Services at catalog@csus.edu with any questions.

Zoi Dokou (zoi.dokou) (Wed, 04 Feb 2026 20:38:41 GMT): Edited to remove GRE requirement for admission as approved by the department in Spring 2025.

Saad Merayyan (merayyan) (Thu, 10 Sep 2026 17:36:56 GMT): Rollback: Per author request

Key: 164