

# MS IN SOFTWARE ENGINEERING

Admission to the MS in Software Engineering is currently suspended, please contact the Department of Computer Science (<https://catalog.csus.edu/colleges/engineering-computer-science/computer-science/>) for further information.

Total units required for MS: 30-33

## Program Description

This degree provides the student with the ability to specialize in the application of software engineering principles to the development of large and complex computer systems.

The program's courses are structured to satisfy two groups of students:

1. those pursuing an MSSE degree and
2. those interested in individual courses.

Individuals wishing to pursue a degree must satisfy the Computer Science graduate program entrance requirements. Those enrolling in individual courses must have an undergraduate degree in Computer Science (or related field) or a minimum of one-year's work experience involving some aspect of software engineering.

The MS Degree in Software Engineering offers, in addition to a core curriculum, advanced studies in the software engineering area. This program covers the entire software application development process from problem definition through requirements, design, implementation, testing, operation, and maintenance.

Teaching associateships are occasionally available for qualified graduate students; these students assist in instruction of undergraduate courses, supervision of laboratory work, and aid faculty members in research projects. Interested persons should apply in the Department office.

## Admission Requirements

Admission as a classified graduate student requires:

- a baccalaureate degree;
- a minimum 3.0 GPA in the last 60 units attempted;
- GRE general test;
- mathematical preparation including two semesters of calculus and one semester of calculus-based probability and statistics corresponding to Sacramento State courses:

Code	Title	Units
MATH 30	Calculus I	4
MATH 31	Calculus II	4
STAT 50	Introduction to Probability and Statistics	4

- Computer Science lower-division preparation including programming proficiency, discrete structures, machine organization, and UNIX and PC-based program development environment proficiency corresponding to Sacramento State courses (see the following) and as evidenced by a pass on the graduate student placement test or a baccalaureate degree in Computer Science;

Code	Title	Units
CSC 15	Programming Concepts and Methodology I	3
CSC 20	Programming Concepts and Methodology II	3
CSC 28	Discrete Structures for Computer Science	3
CSC 35	Introduction to Computer Architecture	3
CSC 60	Introduction to Systems Programming in UNIX	3

- Computer Science advanced preparation as evidenced by a 3.25 GPA in the following Sacramento State upper division Computer Science courses or their equivalent elsewhere:

Code	Title	Units
CSC 130	Data Structures and Algorithm Analysis	3
CSC 131	Computer Software Engineering	3
CSC 132	Computing Theory	3
CSC 134	Database Management Systems	3
CSC 137	Computer Organization	3
CSC/CPE 138	Computer Networking Fundamentals	3
CSC 139	Operating System Principles	3

Applicants with deficiencies in the admission requirements area are advised to remove any such deficiencies before applying.

## Admission Procedures

Applicants must complete a university application that includes supplemental materials by the posted application deadline dates for the term applying. For more admissions information and application deadlines, please visit the Office of Graduate Studies website (<https://www.csus.edu/graduate-studies/future-students/graduate-programs-deadlines.html>), Complete applications include:

- an online application for admission;
- one set of official transcripts from all colleges and universities attended, other than Sacramento State; and
- official GRE general test scores.

## Minimum Units and Grade Requirement for the Degree

Units Required for the MS: 30

Minimum Cumulative GPA: 3.0. No grade below "C" may count toward the degree.


**Note:** Only those courses completed within seven years prior to date of graduation will satisfy course requirements.

## 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 classified graduate student has:

- removed any deficiencies in admission requirements;
- completed at least 12 units of graduate level (200 series) Computer Science courses with a minimum 3.0 GPA; and
- taken a Graduate Writing Intensive (GWI) course in their discipline within the first two semesters of coursework at California State University, Sacramento and passed the course with a grade of B or better.

## Program Requirements

Code	Title	Units
<b>Required Software Engineering Courses (21 Units)</b>		<b>21</b>
Select seven of the following:		21
CSC 230	Software System Engineering	
CSC 231	Software Engineering Metrics	
CSC 232	Software Requirements Analysis and Design	
CSC 233	Advanced Software Engineering Project Management	
CSC 234	Software Verification and Validation	
CSC 235	Software Architecture	
CSC 236	Formal Methods in Secure Software Engineering	
CSC 238	Human-Computer Interface Design	
<b>Required Research Methodology and GWI (4 Units)</b>		
CSC 200	Professional Writing in Computer Science 	3
CSC 209	Research Methodology	1
<b>Restricted Electives (0-3 Units) <sup>1</sup></b>		
Select 0-3 units <sup>2</sup>		0 - 3
<b>Culminating Requirement (2-5 Units)</b>		
Select one of the following:		2 - 5
CSC 500	Master's Thesis <sup>3</sup>	
CSC 502	Master's Project <sup>3</sup>	
<b>Total Units</b>		<b>30-33</b>

<sup>1</sup> Students who select CSC 502 (Master's Project) for 2 units are required to take a 3-unit restricted elective. Students who select CSC 500 (Master's Thesis) for 5 units are not required to take a restricted elective.

<sup>2</sup> Prior to taking an elective course, students must obtain approval from their advisor, and either the Graduate Coordinator or the Department Chair. Students should choose their electives according to the following guidelines: (1) Undergraduate upper-division elective courses whose topics are not covered by any 200-level CSC courses as long as they have not been used towards another degree. (A maximum of 3 undergraduate units may be used in any graduate program); (2) Any 200-level CSC course not already used, with the exception of CSC 295 and CSC 299. An additional three units in this category must be taken if a core course is waived; (3) Related 200-level courses from outside the Computer Science Department may only be taken with prior approval from the Graduate Coordinator or Department Chair and may not have been used in another program.

<sup>3</sup> Students are required to make an oral presentation of their master's project or conduct an oral defense of their master's thesis. The recommended department-level deadline in each semester for submitting an MS project or thesis signed by the Committee Chair and its members to the Graduate Coordinator's office is 10 weekdays prior to the University deadline.