MS IN COMPUTER SCIENCE

Total units required for MS: 30

Program Description

The Computer Science Department offers Master's Degree programs in Computer Science and Software Engineering, Certificates of Advanced Study for students enrolled in the Computer Science program, and a Master's Degree joint program in Computer Engineering.

The primary goal of each of these programs is to prepare students to serve as effective professional computer specialists in a society which increasingly depends on computer usage and technology.

A secondary goal is to prepare interested students for research, teaching, or further study toward the Ph.D. in Computer Science. The programs also enable individuals with background in other areas to obtain the skills and knowledge necessary to enter and advance in employment in computer-related industries.

Completion of the Master of Science in Computer Science requires advanced coursework in a minimum of three of the following areas: computer architecture/computer engineering, database management systems, information assurance and security, intelligent systems, networks and communications, software engineering, and systems software. Students must obtain approval from the department to take more than one course in one area.

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.

Due to the large number of graduate students in Computer Science who are employed, most graduate level courses are offered in the late afternoon or evening.

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 134	Database Management Systems	3
CSC 135	Computability and Formal Languages	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 and a separate departmental application 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 *(*http://www.csus.edu/gradstudies/*)*:

- an online application for admission;
- two sets 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.

Students must have been advanced to candidacy before they can register for Master's thesis or project. Advancement to Candidacy forms are available on the Office of Graduate Studies website. The student fills out the form after planning a degree program in consultation with a Computer Science graduate advisor. The completed form must be signed by the Graduate Coordinator or the Department Chair and is then returned to the Office of Graduate Studies for approval.

Program Requirements

Code	Title	Units
Required Courses (16 Units)		**16**
CSC 200	Professional Writing in Computer Science	3
CSC 201	Programming Language Principles	3
CSC 205	Computer Systems Structure [1]	3
CSC 206	Algorithms And Paradigms	3
CSC 209	Research Methodology	1
CSC 290 Preparation for Culminating Experience		3
Breadth Requirement (9 Units)		
Select one course from three of the following areas:		9
Computer Architecture/Computer Engineering		
CSC 237	Microprocessor Systems Architecture	
CSC 242	Computer-Aided Systems Design and Verification	
CSC/EEE 273	Hierarchical Digital Design Methodology	
CSC/EEE 280	Advanced Computer Architecture	
Database Management Systems		
CSC 212	Bioinformatics: Data Integration and Algorithms	
CSC 244	Database System Design	
Information Assurance and Security		
CSC 250	Computer Security	
CSC 252	Cryptography Theory and Practice	
CSC 253	Computer Forensics	
CSC 254	Network Security	
Intelligent Systems		
CSC 214	Knowledge-Based Systems	
CSC 215	Artificial Intelligence	
CSC 219	Machine Learning	
Networks and Communications		
CSC 255	Computer Networks	
CSC 258	Distributed Systems	
CSC 275	Advanced Data Communication Systems	
Software Engineering		
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	
System Software		
CSC 239	Advanced Operating Systems Principles and Design	
CSC 245	Performance Modeling and Evaluation	
CSC 250	Computer Security	
CSC 251	Principles of Compiler Design	
Restricted Electives (3 Units)		
Select 3 units [2]		3
Culminating Requirement (2 Units)		
Select one of the following:		2
CSC 500	Master's Thesis [3]	
CSC 502	Master's Project [3]	
Total Units		**33-30**

1. Students whose undergraduate preparation has covered a significant amount of the material in CSC 205 or CSC 206 may be given a waiver by the Department from taking one or more of these courses. In this case, for each course waived with department approval, the student must take three additional units from the list below.
2. Students should choose their electives according to the following guidelines:
   1. Any 200-level CSC courses not already used to satisfy the Breadth Requirement, with the exception of CSC 295 and CSC 299. Students not required to take CSC 205 or CSC 206 must, for each course waived, take an additional three units in this category.
   2. 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.) Prior to taking any of these electives, students must obtain approval from the department.
   3. Related 200-level courses from outside the Computer Science Department may only be taken with prior department approval and may not have been used in another program.
3. Students are required to conduct an oral defense of their master's projects or 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 working days prior to the University deadline.