

Computer Science, M.S.

Program of Study

The mission of the graduate program in Computer Science at California State University San Marcos is to provide graduate education of the highest caliber to qualified students from the local community and beyond, leading to the Master of Science degree. Its objective is to prepare students for a variety of positions in business, industry, and the public sector; for continued study at the doctoral level; or for academic careers at the two-year college level. We believe that excellent graduate education is best accomplished in an atmosphere in which graduate students are closely mentored by the faculty. The faculty in Computer Science is committed to the study of Computer Science as a scientific enterprise, and the Master of Science in Computer Science will encourage the development of critical thinking and quantitative reasoning skills. In keeping with the mission of the University, we offer a curriculum that includes opportunities for applied experiences to enhance the professional development of our students and to contribute to the community around us. In addition, our program seeks to recognize the global awareness of the computing world and to build links with higher education institutions in the world.

The Master of Science Program in Computer Science provides breadth in several areas and depth in a specialized area in the rapidly advancing theoretical and practical aspects of Computer Science. Common to these offerings are the intelligent challenges and analytical skills of computational problem-solving methodologies.

Program Student Learning Outcomes

Students who graduate with a Master of Science in Computer Science will be able to:

1. Analyze the architectures of current and emerging computer technologies.
2. Design, implement and test software based on the object-oriented paradigm to meet specific requirements.
3. Apply theoretical foundations that they have learned.
4. Evaluate and compare different algorithms given a task.
5. Conduct independent research in a specific topic in Computer Science: develop, document and present clearly.
6. Independently acquire new computer-related skills based on previous knowledge.

Preparation and Training Offered by the Program

The Master of Science degree is traditionally seen either as a preparatory or terminal degree. Our program is designed to accommodate students with different goals. The active research programs of our faculty, and our recognition of Computer Science as a scientific enterprise, shall provide graduate students with the intensive research training and course work in primary content areas that are central to preparation for more advanced graduate or professional work. Students who have in mind careers in business, industry, community college teaching and computing services, will benefit from our program's emphasis on critical thinking, research methods, and advanced course work. Individual career goals will be served by allowing choices in the content of the research work of thesis or project and by providing a curriculum that provides flexibility in content areas. Students with interests in many areas in Computer Science will find opportunities to pursue course work and thesis topics at Cal State San Marcos that are related to their interests.

The Master of Science degree in Computer Science emphasizes both theoretical foundations and practical applications. Many students undertake graduate work in Computer Science in order to pursue careers in computer networking and information communications, algorithms, parallel processing, artificial intelligence, neural networks, programming languages concepts, and multimedia applications. Graduates of the program will be prepared for a wide range of career opportunities, since the skills and

attitudes fostered in the program are in demand in business, industry, government and academia. In particular, graduates will be well prepared for careers in applications programming, systems analysis, and software engineering.

The program also prepares students to compete for admission to doctoral programs in Computer Science. There are several universities near Cal State San Marcos, including UCSD, UC Riverside, and UC Irvine, that offer such Ph.D. programs.

Admission Requirements and Application

In general, students should have equivalent of the basic core knowledge in Computer Science. Experience in clear, concise, careful writing is valuable for success in all courses.

People with undergraduate degrees in non-computing fields may want to enroll in this program for career advancement. Those with undergraduate degrees in Computer Science can take more advanced courses to specialize in a particular area.

Admission to the program requires an undergraduate degree including many of the courses as required for the Bachelor's Degree in Computer Science at Cal State San Marcos, or their equivalents. Admission also requires a 3.0 grade point average in the upper-division Computer Science courses and at least a 2.5 GPA in the last 60 semester units (or last 90 quarter units) attempted.

The general test of the Graduate Record Examination (GRE) is required of all applicants and the advanced test in Computer Science is encouraged. Minimum GRE Scores required are:

- Verbal 143
- Quantitative 155
- Analytical Writing 3.5, or 3.0 with TOEFL Writing 20 or above/IELTS Writing 6.0 or above

Students with a 3.0 Analytical Writing but satisfy other admission criteria may be conditionally admitted and must satisfy the Graduate Writing Assessment Requirement - Graduate Level (GWARGL) within the first year of study.

Students who have some deficiencies in the above admission requirements may be admitted with conditional graduate status. They may remove these academic deficiencies by either taking specific undergraduate courses for no credit toward the Master's degree, or passing appropriate proficiency examinations.

All applicants who do not possess a bachelor's or graduate degree from a post-secondary institution in a country where English is a principal language must take the Test of English as a Foreign Language (TOEFL) and receive a minimum score of 80 iBT, or IELTS overall and score of 6.0, with a writing score no lower than 6.0 and no section score below 5.5.

An application consists of the following:

- A completed university application form via [Cal State Apply](#)
- Application fee
- One set of official transcripts from all colleges and universities attended, with indication of graduation (if not in English, certified English translations must be included) to the Graduate Admissions Office.
- A completed departmental application for the Master's program in Computer Science, sent directly to the Computer Sciences Graduate Admission Coordinator.
- GRE, and TOEFL if applicable, scores sent directly from the respective testing center, and
- Three letters of recommendation sent directly to the Computer Sciences Graduate Coordinator.

Application Deadlines:

Complete applications, including test scores and recommendation letters, should be received in the program office by the dates indicated on the department's web site.

Graduation Requirements

The Master of Science degree in Computer Science requires a minimum of 30 units of graduate courses with at least an overall 3.0 grade point average. No course or equivalent that was taken as a requirement for the completion of a Bachelor of Science in Computer Science or related fields can be used to satisfy these requirements. Not more than nine (9) units in approved extension

and transfer courses may be used to satisfy the minimum units required for the degree; any such units must be approved by the Graduate Coordinator. Given the nature of rapid development in Computer Science, all requirements should be satisfied within five years of initial acceptance into the program or course work must be repeated. al acceptance into the program or course work must be repeated.

Students are required to take the following graduate-level core courses (7 units):

- [CS 500 - Research Preparation in Computer Science](#) **Units: 1**
- [CS 542 - Design Patterns and Object-Oriented Analysis](#) **Units: 3**
- [CS 571 - Artificial Intelligence](#) **Units: 3**

And two more core courses to be selected from the following list (6 units):

- [CS 512 - Introduction to Data Mining](#) **Units: 3**
- [CS 513 - Analysis and Intractability of Algorithms](#) **Units: 3**
- [CS 537 - Data Communication and Computer Networks](#) **Units: 3**

Note: Students are strongly advised to complete these core courses before selecting their electives. Students must take [CS 500](#) as one of the first nine (9) units towards the degree.

Electives (12 Units)

- Only CS courses numbered 500 or higher and up to three (3) units of 400-level courses can be counted toward the Master's degree.
- At least three (3) units, must be numbered 600 or above.

Continuation

A student must earn a 3.0 overall average in graduate coursework in order to graduate. No course in which a final grade below C (2.0) was earned can satisfy the degree requirement. If the GPA falls below 3.0 for two consecutive semesters, the student will be dropped from the program.

Financial Aid

Several sources of financial aid are available to graduate students. Applicants who choose to apply for Graduate Assistantships offered by the University should so indicate on the appropriate space in the Master's Program in Computer Science application form. Students are responsible for identifying other sources of aid, and may wish to consult with the University's Office of Financial Aid and Scholarship.

Graduation Writing Assessment Requirement – Graduate Level (GWARGL)

Students need to fulfill the Graduation Writing Assessment Requirement – Graduate Level (GWARGL) before advancing to candidacy. Please refer to [Graduation Writing Assessment Requirement – Graduate Level \(GWARGL\)](#) for more information regarding this requirement.

Advancement to Candidacy

Upon the completion of [CS 500](#), the student must obtain the permission of a tenured or tenure-track Computer Science faculty member to act as the student's advisor and as chair of the student's academic committee. The student and the advisor shall recommend to the Computer Science Graduate Coordinator the name of another tenured or tenure-track Computer Science faculty to fill the advisory committee. A faculty member from another department or an individual from a related industry can be added to the committee if that member has expertise in the area of the student's research.

The plan of study shall include courses remaining to be taken and the names of the two or three faculty composing the committee. A copy of the study plan shall be submitted to the Computer Science Graduate Coordinator. The student is advanced to candidacy for the Master of Science degree upon submission of the study plan and completion of nine(9) units toward the degree with at least a

3.0 grade point average. Changes in the study plan must be approved by the student's advisor and the Computer Science Graduate Coordinator.

No student may enroll in [CS 699A](#), [CS 699B](#), [CS 699C](#) (total of five units) before being advanced to candidacy.

Thesis

Each student will be assigned an advisor at the time of acceptance to the program. It is expected that the student and her/his advisor will work together closely to identify elective courses and choose possible research topics for the thesis.

A thesis is the written result of a systematic study of a significant Computer Science problem. It defines, develops, and executes an investigation into a chosen problem area. The motivation, approach, and results of the investigation are communicated in a clear and logical fashion; it is grammatically correct, logically organized, and technically sound. The finished product should evidence originality and critical and independent thinking through documentation. The thesis must be planned, organized, executed, and completed while the student is enrolled in the Master's program. Guidelines on the preparation and official submission of the thesis can be obtained from the Graduate Coordinator. The final copies of the thesis are to be delivered to the committee members at least two (2) weeks prior to the oral defense of the thesis, which must be held at least two weeks prior to the end of a regular semester.

Graduation

A student planning to graduate at the end of a given regular semester must meet with the academic advisor by the end of the student's previous regular semester in order to evaluate those plans. All pertinent requirements described above concerning courses and the thesis, the project, or the comprehensive exam must be evaluated during this meeting.

Maximum of 3 units of CS4XX
 13 units of core (CS500 and 4 more)
 Minimum of 3 units of CS6XX elective

Total units from core	13
Total units from elec	12
Total units from 699	5

4 semester plan

Student name: _____ Advisor: _____ Start Term: _____

Semester	research	class	class	class	Units
1	CS500(1)	cs	cs	cs	10
2	699A(1)	cs	cs	cs	10
3	699C(3)	cs	cs6XX		9
4	699A(1)				1
					30

advance to candidacy upon passing CS500

3 semester plan

Student name: _____ Advisor: _____ Start Term: _____

Semester	research	class	class	class	Units
1	CS500(1)	cs	cs	cs	10
2	699B(2)	cs	cs	cs	11
3	699C(3)	cs	cs6XX		9
4					
					30

advance to candidacy upon passing CS500

Part-time domestic students may spread out 699 units