**Master of Science in Computer Science**

**Requirements (45 units)**

**Program Code: CSCM**

The Master of Science in Computer Science degree program provides a technically oriented postbaccalaureate scientific education for those who wish to acquire or extend their knowledge in the field of computer science. The program combines both the study of modern computer devices and their applications along with the study of the philosophical foundations which underlie the discipline.

In addition to the above goals and objectives, the program is also committed to improving the writing and communication skills of the student.

**Admission to the Program**

In addition to the general requirements of the university, specific requirements for admission to classified graduate status are:

1. An acceptable score on the GRE (general examination only);
2. Three letters of recommendation;
3. Completion of the graduate entrance writing requirement;
4. A statement of purpose from the student; and
5. Either A or B below:
   a. A baccalaureate degree in computer science;
   b. A baccalaureate degree in a related field with a cumulative grade point average of "B" (3.0) or better with no grade lower than "C +" (2.3) in a selection of program preparatory courses including:
      - The equivalent of a one-year sequence of "Introduction to Computer Science" courses, as defined by the ACM Curriculum Committee as courses CS1 and CS2. This can be satisfied by the successful completion of:
        - CSE 201 Computer Science I
        - CSE 202 Computer Science II
        - CSE 330 Data Structures
      - Courses in calculus and discrete mathematics equivalent to:
        - MATH 211 Basic Concepts of Calculus
        - MATH 212 Calculus II
        - MATH 213 Calculus III
        - MATH 272 Discrete Mathematics
        - MATH 372 Combinatorics
      - Courses in computer science equivalent to:
        - CSE 310 Digital Logic
        - CSE 313 Machine Organization
        - CSE 401 Contemporary Computer Architecture
        - CSE 431 Algorithm Analysis
        - CSE 455 Software Engineering
        - CSE 460 Operating Systems
        - CSE 500 Introduction to Formal Languages and Automata

**Advancement to Candidacy**

In order to be advanced to candidacy, a student must have:

1. Achieved classified standing;
2. Secured a major advisor from the School of Computer Science and Engineering for the preparation of the thesis or the implementation of a project;
3. Completed at least 12 quarter units and no more than 20 quarter units of work applicable to the degree program as a graduate student at this university with a minimum grade point average of 3.0 ("B");
4. Submitted a formal program of graduate study prepared in consultation with and approved by the School of Computer Science and Engineering graduate committee and/or the major advisor. This program of graduate study should include an abstract to serve as a thesis research proposal for thesis option or a tentative title and description of the project for the project option, or enrollment in CSE 689 for the exam option;
5. For students choosing the project option, satisfactory passage of the comprehensive oral examination to be administered by the graduate committee;
6. Obtained final approval of the program and of the candidacy itself by the School of Computer Science and Engineering graduate committee and the Dean of Graduate Studies.

**Requirements for Graduation**

1. A minimum of 45 quarter units of acceptable graduate-level work included in the formal program with 500- and 600-level courses in computer science. No more than eight units may be earned from 500-level courses;
2. Advancement to candidacy and approval of the specific program of study;
3. A public presentation for the thesis or project option;
4. Completion of a final oral examination concluded by acceptance of the thesis, for the thesis option; satisfactory completion of the comprehensive oral examination and completion of the project, for the project option; or satisfactory completion of the comprehensive written examination, for the examination option;
5. The program must be completed within a seven-year period. No more than seven years may elapse between the time of registration for the earliest course listed on the program and completion of all requirements for the degree;
6. A grade point average of at least 3.0 ("B") in all graduate course work fulfilling the requirements of the Master of Science in Computer Science and grades of "C" (2.0) or better in all courses in the program;
7. For the thesis option, the student will submit the written thesis in bound form to the department. For the project option, the student will submit the written software engineering documentation in bound form to the department;
8. The graduation writing requirement is met upon successful completion of term papers in the graduate courses taken by the student and the writing of the thesis or software engineering documentation of the project;
9. Any additional general requirements not cited above and listed in Graduate Degree and Program Requirements (http://bulletin.csusb.edu/graduate-degree-programs/graduate-degree-program-requirements).
Department Graduate Committee and Major Advisor

The School of Computer Science and Engineering graduate committee consists of the graduate coordinators and two or more faculty members from the School of Computer Science and Engineering. The committee has general supervision over the work of students progressing towards the master's degree and will determine whether students are adequately prepared for graduate study. Each new graduate student should consult with the graduate coordinator for advice in the selection of the appropriate program of graduate study.

Students enrolled in the thesis or project option must choose and be accepted by a major advisor prior to their advancement to candidacy and the initiation of a thesis or project. The major advisor in consultation with the student will develop a program of graduate study consisting of specific courses and an acceptable thesis abstract or project proposal based on the student's interest, abilities and preparation. The major advisor will direct this research.

The program of graduate study as well as any subsequent modification of the thesis or project are subject to the approval of the School of Computer Science and Engineering graduate committee and the Dean of Graduate Studies.

Students enrolled in the exam option are advised by the graduate coordinator. The program of study for the exam option consists of declaring and choosing the exam option and may not be modified to the thesis or project option.

Thesis Preparation, Presentation and Examination

The student must conduct a research study, and from these efforts, write a thesis acceptable to the student's thesis committee and the Dean of Graduate Studies. The student's thesis committee shall be chaired by the major advisor and two other faculty members who are chosen by the student upon consultation with the major advisor and the graduate coordinator. The thesis topic and major advisor must be included on the program of study submitted with the application to candidacy, although this may be amended.

The student shall enroll in CSE 699 at a rate of two to six units per quarter for all contiguous academic year quarters starting from the time of advancement to candidacy until the thesis is completed and accepted. Over that period, nine units of CSE 699 will count toward the degree.

The student, upon completion of the thesis, must give a public presentation of the research and stand for the defense of the thesis. The project topic and major advisor must be included on the program of graduate study submitted with the application to candidacy, although this may be amended.

The student shall enroll in CSE 690 at the rate of two to five units per quarter for all contiguous academic quarters starting from the time of advancement to candidacy until the project is completed and accepted. Over that period, five units of CSE 690 will count toward the degree.

The student, upon completion of the project, must give a public presentation. The student is given a maximum of five years from the time the student was advanced to candidacy to finish the degree.

Comprehensive Written Examination

The student shall enroll in CSE 689 after consultation with the graduate coordinator and completion of the last core course(s). CSE 689 is an independent study course in preparation of the comprehensive examination and may be repeated only once. Students enrolled in CSE 689 must take and pass a written examination on the material in the core courses.

Degree Requirements (45 units)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
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</thead>
<tbody>
<tr>
<td>CSE 602</td>
<td>Computation and Complexity Theory</td>
<td>4</td>
</tr>
<tr>
<td>CSE 610</td>
<td>Modern Computer Architecture</td>
<td>4</td>
</tr>
<tr>
<td>CSE 630</td>
<td>Theory of Algorithms and Their Analysis</td>
<td>4</td>
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<tr>
<td>CSE 655</td>
<td>Software Engineering Concepts</td>
<td>4</td>
</tr>
<tr>
<td>CSE 660</td>
<td>Operating Systems Concepts and Theory</td>
<td>4</td>
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<tr>
<td></td>
<td>Twenty-five units from one of the following options:</td>
<td>25</td>
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<td>Total Units</td>
<td>45</td>
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Examination Option

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<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
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<tbody>
<tr>
<td>CSE 689</td>
<td>Comprehensive Examination</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Twenty-four units of elective coursework chosen from 500- to 600-level computer science courses deemed appropriate by the department graduate committee. Up to eight units of 500-level computer science courses may be taken.</td>
<td>24</td>
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<td>Total Units</td>
<td>25</td>
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Project Option

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<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
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</thead>
<tbody>
<tr>
<td>CSE 690B-E</td>
<td>Masters Project (2-5 units for a total of 5)</td>
<td>5</td>
</tr>
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<td></td>
<td>Twenty units of elective coursework chosen from 500- to 600-level computer science courses deemed appropriate by the department graduate committee. Up to eight units of 500-level computer science courses may be taken.</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>Total Units</td>
<td>25</td>
</tr>
</tbody>
</table>

Thesis Option

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSE 699B-F</td>
<td>Thesis (2-5 units for a total of 9)</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>Sixteen units of elective coursework chosen from 500- to 600-level computer science courses deemed appropriate by the department graduate committee. Up to eight units of 500-level computer science courses may be taken.</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>Total Units</td>
<td>25</td>
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