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Introduction

Keep This Handbook

Please keep this handbook intact for your reference. Updated versions are available approximately twice a year, on the Computer Science website. Also, please buy a Sacramento State Student’s Registration and Advising Handbook at the bookstore. It has valuable information not covered here. Course descriptions are available at http://catalog.csus.edu/.

Where to Find Blank Forms

Most blank forms are available on our website, www.ecs.csus.edu/csc; very few forms are available in the office. Other forms originate from the Office of Graduate Studies (OGS) and are available in River Front Center (RFC) Room 206 or at the OGS website: http://www.csus.edu/gradstudies/forms.htm.

Who to Ask What

If you still have questions about the MS in Computer Science or the MS in Software Engineering after reading this handbook, please contact the Computer Science Graduate Coordinator, Dr. Nik Faroughi (faroughi@ecs.csus.edu).
MS in Computer Science
MS in Software Engineering

Program Goals

- To prepare students to serve as effective professional computer specialists and/or software engineers in our society;
- To prepare students for research, teaching, or further study towards the PhD in Computer Science and/or Software Engineering;
- To enable individuals with background in other areas to obtain the skills and knowledge necessary to enter and/or advance in employment in computer-related industries.
COMPUTER SCIENCE FACULTY AND STAFF

Cui Zhang, Department Chair
Anne-Louise Radimsky, Associate Chair
Nik Faroughi, Graduate Coordinator

FACULTY
Behnam Arad
Robert Buckley
Senad Busovaca
Weide Chang
John Clevenger
Isaac Ghansah
V. Scott Gordon
Ying Jin
Ted Krovetz
Kwai-Ting Lan
Mary Jane Lee
Meiliu Lu
William Mitchell
Martin Nicholes
Jinsong Ouyang
Ahmed Salem
Chung-E Wang
Du Zhang

Administrative Support
Veronica Pruitt and Ophelia Rodriguez

Department Office
Riverside Hall 3018, (916) 278-6834
http://www.ecs.csus.edu/csc/

Office of Graduate Studies
River Front Center 206, (916) 278-6470
http://www.csus.edu/gradstudies/

Office of Global Education
Lassen Hall 2304, (916) 278-6686
http://www.csus.edu/oge/

Handbook compiled by V. Pruitt
July 20, 2011
ADMISSION REQUIREMENTS

Admission as a fully classified graduate student in either Computer Science or Software Engineering requires:

1. A baccalaureate degree;
2. A minimum 3.0 GPA in the last 60 units attempted;
3. GRE general test (no minimum; score will be compared with those of other applicants);
4. Mathematical preparation including two semesters of calculus and one semester of calculus-based probability and statistics, corresponding to Sacramento State courses Math 30, Math 31, and Stat 50;
5. 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 CSC 15, CSC 20, CSC 28, CSC 35, and CSC 60, and as evidenced by a pass on the graduate student placement test or a baccalaureate degree in Computer Science;
6. 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: CSC 130, Data Structures; CSC 131, Computer Software Engineering; CSC 132, Computing Theory; CSC 134, Database Management and File Organization; CSC 137, Computer Architecture; CSC 138, Computer Networks and Internets; and CSC 139, Operating System Principles.

Other Requirements

Sacramento State requires that all graduate applicants, regardless of citizenship, whose native language is not English, and whose education at all levels was not completed in the English language, must pass the Test of English as a Foreign Language (TOEFL). A minimum score of 550 must be achieved on the written examination, or a minimum of 213 on the computer-based test, or a minimum of 80 on the Internet-based version. (Note: the computer-based test and the Internet-based tests are different versions.)

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

PREPARATION FOR ADMISSION

Although a Bachelor's Degree in Computer Science is not necessary, applicants for both the MS in Computer Science and MS in Software Engineering programs must meet the admission requirements described earlier. The Department may grant conditional admission to students who are likely to complete all admission requirements within one or two semesters after they enter the graduate program. See the “Undergraduate Computer Science Courses Satisfying Admission Requirements” section later in this document.
Students lacking a background in computer science may acquire it in one or more of the following ways:

1. Enroll at a local community college in courses equivalent to Sacramento State lower-division prerequisites and transfer to Sacramento State at a later date for the upper-division prerequisites (articulation agreements can be found at www.assist.org);
2. Enroll at Sacramento State as a second bachelor's degree student and after satisfying all deficiencies, apply for classification in the graduate program;
3. Register in regular University classes through the “Open University” program offered by the College of Continuing Education (CCE). The CCE registration counter is located in Napa Hall. Call (916) 278-4433 for more information.

APPLICATION FOR ADMISSION

All prospective graduate students, including Sacramento State graduates, must file the following with the Sacramento State Office of Graduate Studies, River Front Center 206 (916) 278-6470:

1. An online application for graduate admission; use the SAC STATE application website: http://www.csumentor.edu/AdmissionApp/;
2. Two sets of official transcripts from other colleges and universities attended;
3. GRE general test scores.
4. NO recommendation letters are required.

Please visit http://www.csus.edu/gradstudies/ for application deadlines and instructions on submitting application materials.

ADMISSION DECISIONS

1. Applications are first processed by either the University's International Admissions Office in Global Education or the Office of Graduate Studies (which handles applications of domestic students) to ensure that all SAC STATE requirements have been met.
2. Although we may receive your application from International Admissions or Graduate Studies long before the deadline, no decision will be made until after the application deadline, in order to consider all qualified applications before making recommendations.
3. We may recommend that you be admitted as fully classified or conditionally classified. In the case of conditional classification, the courses required to remove deficiencies will be determined by an evaluation of your transcripts and will be specified in the letter of acceptance. (At this point a decision to deny admission is usually based on inadequate preparation in Computer Science.) Note: For MS students who are admitted with conditions stated in their admission letters (e.g. undergraduate courses), the department offers placement/waiver tests one week before the first semester of their MS program.
4. A decision regarding admission will be mailed to you by the Office of Graduate Studies or International Admissions.
FLOW CHART OF ADMISSION REQUIREMENTS
MS in Computer Science and MS in Software Engineering
July 1, 2007

Computer Science Requirements

Math Requirements

Prerequisite that may be taken concurrently

Prerequisite
UNDERGRADUATE COMPUTER SCIENCE COURSES
SATISFYING ADMISSION REQUIREMENTS

Prerequisites are listed in parentheses.

CSC 15 Programming Concepts & Methodology I (CSC 10 or programming experience)
CSC 20 Programming Concepts & Methodology II (CSC 15)
CSC 28 Discrete Structures for Computer Science (MATH 29, CSC 20; CSC 20 may be taken concurrently)
CSC 35 Introduction to Computer Architecture (CSC 15)
CSC 60 Introduction to Systems Programming in UNIX (CSC 20, CSC 35)
CSC 130 Data Structures and Algorithm Analysis (CSC 20, CSC 28; CSC 28 may be taken concurrently)
CSC 131 Computer Software Engineering (CSC 130; may be taken concurrently)
CSC 132 Computing Theory (CSC 28, CSC 130; CSC 130 may be taken concurrently)
CSC 134 Database Management and File Organization (CSC 130)
CSC 137 Computer Organization (CSC 28, CSC 35, CSC 130)
CSC 138 Computer Networks and Internets (CSC 35, CSC 60, CSC 130)
CSC 139 Operating System Principles (CSC 60, CSC 137; or equivalents)

FINANCIAL AID

The Department has a very small number of openings for Instructional Student Assistants (ISA’s), who may supervise laboratory work and/or grade student papers. Interested persons should apply in the Department office after they join the program.

Federal Work Study, fellowships, grants, and various loans are available to students who are U.S. citizens. Please contact the Financial Aid Office on campus for an application package. Please note: Except for employment opportunities, there is no financial aid available for international students.

COMPUTER ACCOUNTS AND MAILING LIST

Every Sac State student must set up a SacLink email account with the University in order to access “MY SAC STATE” (https://my.csus.edu). You can do this at https://www.saclink.csus.edu/saclink/.

You should also set up a network account with the College of Engineering and Computer Science at http://www.ecs.csus.edu/index.php?content=accounts/ and subscribe to cscgradlist in order to receive important messages from the Graduate Coordinator. Send an email from your ECS or Saclink account to: cscgradlist-join@ecs.csus.edu. The subject and message can be blank, but be sure to do the confirmation step after receiving a confirmation email! (To unsubscribe, email: cscgradlist-leave@ecs.csus.edu.)

Tip: If you have multiple email accounts, make sure they all forward automatically to one that you check regularly so that you won’t miss any important messages.
ADVISING

You will be advised by the Graduate Coordinator until you are fully classified. Once you are fully classified, you will be assigned to an advisor. Please refer to the department’s list of advising office hours and see the appropriate advisor during those hours. Note: You must be advised at least once during an academic year, or you will have a registration hold placed on your record. Once your advisor has signed and dated your form, submit it to the department. We will drop your hold and keep your form on file for you. When you seek further advising, ask department staff for your form; get it updated and return it to the department.

STUDENT ADVISING FORM FOR MS IN COMPUTER SCIENCE

This form is also available on the web at http://www.ecs.csus.edu/csc/.

Student’s Name:________________________________________  Work Phone:________________________________________
Address:____________________________________________  Home or Cell:________________________________________
SAC STATE ID #:_______________________  Email Address________________________________________
Advisor’s Name:________________________________

Initial Advising Information

Today’s Date: _________________________  Semester and Year Classified: _________________________
Initial classification (check one): _____ Full   _____ Conditional (complete section I)
Current GPA:  ___________  Check if on probation or academic warning:______

I.  Completion of Conditions for Full Classification

<table>
<thead>
<tr>
<th>Courses Required</th>
<th>Grade</th>
<th>Semester Taken</th>
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<tbody>
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</tbody>
</table>

Verified by ___________________________________  Date:______________
(Graduate Coordinator’s signature)

II.  Core Requirements

For those eligible to take graduate-level courses, CSC 201, 204, 205 and 206 must be completed in the first two semesters of attendance.

<table>
<thead>
<tr>
<th>Courses</th>
<th>Grade</th>
<th>Semester Taken</th>
<th>Substitution if Waived*</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSC 201</td>
<td>______</td>
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<td>________________________</td>
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<tr>
<td>CSC 204</td>
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<td>CSC 205</td>
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<td>CSC 206</td>
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<tr>
<td>CSC 209</td>
<td>______</td>
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</tbody>
</table>

*Each course waived must be replaced by an additional restricted elective with your advisor’s recommendation, and approved by the Graduate Coordinator or Chair.
III. **Breadth Requirement for MS in Computer Science**

Select three areas. From each of them, select one course.

<table>
<thead>
<tr>
<th>Courses Required</th>
<th>Grade</th>
<th>Semester Taken</th>
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</table>

IV. **Restricted Electives**

(Select courses from the restricted list, with your advisor’s recommendation, and have them approved by the Graduate Coordinator or Chair. A minimum of two courses is required for students doing the MS project, and one course for the MS thesis. One additional elective must be taken for each course waived from the core requirement.)

<table>
<thead>
<tr>
<th>Courses Required</th>
<th>Grade</th>
<th>Semester Taken</th>
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V. **Culminating Requirements**

(Thesis requires the Graduate Committee’s approval of topic and content, two readers, and a thesis presentation.)

Thesis or Project (check one): 500 502 Semester registered: ________________

Topic:_________________________________________________________________________

_____________________________________________________________________________

Faculty Sponsor: _______________________________________

Advisor’s Signature (one for each update)

<table>
<thead>
<tr>
<th>Date</th>
<th>GPA</th>
<th>Status</th>
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</table>

Substitutions and waivers of required courses must be approved on the department’s Petition for Substitution or Waiver of Required Courses with Non-articulated Courses. Obtain the signature of the appropriate Computer Science Course Coordinator for the course in question and then submit the form to the Graduate Coordinator’s Office. Your advisor can inform you of the appropriate Course Coordinator.

The department offers waiver tests for CSC 204 and CSC 205 once a semester, one week before the first semester starts. The date is announced in advance to students via “cscgradlist.” If CSC 204 and/or CSC 205 are waived, the student must take 3 additional units of electives per course waived.

Rev. 7/1/10
STUDENT ADVISING FORM FOR MS IN SOFTWARE ENGINEERING

This form is also available on the web at http://www.ecs.csus.edu/csc/.

Student’s Name:________________________________________  Work Phone:________________________________________

Address:____________________________________________  Home or Cell:________________________________________

SAC STATE ID #:____________________________________  Email Address________________________________________

Advisor’s Name:____________________________________

Initial Advising Information

Today’s Date: _________________________  Semester and Year Classified: _________________________

Initial classification (check one):  _____ Full   _____ Conditional (complete section I)

Current GPA:  ___________ Check if on probation or academic warning:______

I. Completion of Conditions for Full Classification

<table>
<thead>
<tr>
<th>Courses Required</th>
<th>Grade</th>
<th>Semester Taken</th>
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Verified by _________________________________       Date:_______________

(Graduate Coordinator’s signature)

II. Required Software Engineering Courses (select 7 out of 8)

<table>
<thead>
<tr>
<th>Courses</th>
<th>Grade</th>
<th>Semester Taken</th>
<th>Substitution if Waived*</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSc 230</td>
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<td>CSc 231</td>
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<td>CSc 232</td>
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<td>CSc 236</td>
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<td>CSc 238</td>
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</table>

*Each course waived must be replaced by an additional restricted elective with your advisor’s recommendation, and approved by the Graduate Coordinator or Chair.
III. Required Research Methodology

<table>
<thead>
<tr>
<th>Required Course</th>
<th>Grade</th>
<th>Semester Taken</th>
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</thead>
<tbody>
<tr>
<td>CSC 209</td>
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</table>

IV. Restricted Electives

Select courses from the restricted list, with your advisor’s recommendation, and have them approved by the Graduate Coordinator or Chair. A minimum of two courses is required for students doing the MS project, and one course for the MS thesis. One additional elective must be taken for each course waived from the required software engineering courses.

<table>
<thead>
<tr>
<th>Courses</th>
<th>Grade</th>
<th>Semester Taken</th>
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</tbody>
</table>

V. Culminating Requirements

(Thesis requires the Graduate Committee’s approval of topic and content, two readers, and a thesis presentation.)

Thesis or Project (check one): _____500  ____502  Semester registered: ________________

Topic: __________________________________________________________

Faculty Sponsor: ________________________________________________

Advisor’s Signature (one for each update)

<table>
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<tr>
<th></th>
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<th>GPA</th>
<th>Status</th>
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</tbody>
</table>

Substitutions and waivers of required courses must be approved on the department’s Petition for Substitution or Waiver of Required Courses with Non-articulated Courses. Obtain the signature of the appropriate Computer Science Course Coordinator for the course in question and then submit the form to the Graduate Coordinator’s Office. Your advisor can inform you of the appropriate Course Coordinator.

Rev. 7/1/10
SUBSTITUTION OR WAIVER PETITION
MS IN COMPUTER SCIENCE – MS IN SOFTWARE ENGINEERING

MS students: Use this form to establish approval of course substitutions or waivers in your department file. If this form is approved, you may list the substitution(s) on your application for advancement to candidacy. Note: If you deviate from the courses listed on your advancement to candidacy application after it is filed with the Office of Graduate Studies, you must submit a “Petition for Exception.”

MS students who are admitted with conditions stated in their admission letters (e.g. undergraduate courses) should take the placement/waiver tests the department offers one week before the first semester of their MS program.

Name: ______________________________________ SAC STATE ID #: ______________________

Email Address: ________________________________ Catalog used (year): ______________________

Check one: □ MS in Computer Science   □ MS in Software Engineering  

SAC STATE Course #: __________________ Substitution Course #: __________________________

Institution Where Taken: __________________________________________________________________

Additional comments by Course Coordinator/Graduate Coordinator: ____________________________
_______________________________________________________________________________________
_______________________________________________________________________________________

<table>
<thead>
<tr>
<th>Computer Science Course Coordinator</th>
<th>Student</th>
</tr>
</thead>
<tbody>
<tr>
<td>[] The proposed substitute course has at least the same number of semester units and is an adequate substitution for the required course.</td>
<td>If approved, list the substitute course on your application for advancement to candidacy.</td>
</tr>
<tr>
<td>[] The substitute course has fewer units or has quarter-system units but otherwise is an adequate substitution for the required course. (Check one below.)</td>
<td></td>
</tr>
<tr>
<td>___ An additional course is recommended. The course is: _______________</td>
<td></td>
</tr>
<tr>
<td>___ Waiving the difference in units is recommended. The student already has a background that compensates for the units missed and will not be short units needed to graduate.</td>
<td>If approved, list both courses on your application for advancement to candidacy.</td>
</tr>
<tr>
<td>If approved, list the substitute course on your application for advancement to candidacy and the words “difference in units waived.”</td>
<td></td>
</tr>
</tbody>
</table>

APPROVED: _______________________________ ______________________
Computer Science Course Coordinator  Date

APPROVED: _______________________________ ______________________
Computer Science Graduate Coordinator  Date
If you are admitted as conditionally classified, classification is not automatic once you have completed the requirements to become fully classified. You must fill out a Classification Application form (available online at: http://www.csus.edu/gradstudies/forms.htm) and submit it to the department with related documents attached (e.g. “MY SAC STATE” records, other transcripts, GRE test report, etc.). The Graduate Coordinator will make a recommendation on the form and forward it to the Office of Graduate Studies for approval, who in turn will send you a copy of the final decision.

### Classification Application

<table>
<thead>
<tr>
<th>Sac State ID #:</th>
<th>Day Time Telephone Number</th>
<th>Email</th>
</tr>
</thead>
<tbody>
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<table>
<thead>
<tr>
<th>Name:</th>
<th>Address:</th>
<th>City/State/Zip:</th>
<th>Semester:</th>
<th>Year:</th>
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<table>
<thead>
<tr>
<th>Currently classified at Sacramento State as (check ONE and indicate program):</th>
<th>Current:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Degree Program (specify, if applicable)</td>
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<tr>
<td>□ Classified</td>
<td>□ Conditionally Classified</td>
</tr>
</tbody>
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<thead>
<tr>
<th>NEW:</th>
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<table>
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<tr>
<th>Currently classified at Sacramento State as:</th>
<th>In:</th>
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<td></td>
<td></td>
</tr>
<tr>
<td>□ Conditionally Classified</td>
<td>□ Pre-MBA</td>
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<table>
<thead>
<tr>
<th>SECTION 3 - Signature (all students)</th>
</tr>
</thead>
<tbody>
<tr>
<td>My signature certifies the accuracy and completeness of the information provided. I understand that any misrepresentation may be cause for denial or cancellations of admission or enrollment.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Student Signature:</th>
<th>Date:</th>
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<tr>
<th>SECTION 4 - Department Recommendations (all students):</th>
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<table>
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<tr>
<th>□ Fully Classified</th>
<th>□ Pre-MBA</th>
<th>□ Certificate Only</th>
<th>□ Credential</th>
</tr>
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<tbody>
<tr>
<td>□ Conditionally Classified (conditions):</td>
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<th>Denied - Reason:</th>
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<tr>
<th>Faculty Advisor (print legibly):</th>
<th>Graduate Coordinator (print legibly):</th>
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<th>□ PBUC</th>
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<th>□ Cond. Class.</th>
<th>□ Certificate</th>
<th>□ Denied</th>
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<tr>
<th>Dean of Graduate Studies:</th>
<th>Date:</th>
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WRITING PROFICIENCY

All graduate students must meet the Graduate Writing Assessment Requirement (GWAR). You are required to take the Sac State Writing Placement Exam for Graduate students (WPG). Please check [http://www.csus.edu/gradstudies/gwar.html](http://www.csus.edu/gradstudies/gwar.html) for the examination schedule and take the WPG in the first semester of your MS Program. Criteria for waiving the WPG are listed in the form below, which is available in the Office of Graduate Studies. A waiver must be approved by the Dean of Graduate Studies. In all cases, writing proficiency must be demonstrated before a student can be advanced to candidacy.

Office of Graduate Studies

Writing Placement for Graduates (WPG)

Waiver Form

Last Name: 
First Name: 
Middle Initial: 
Student ID No.: 
Major: 
Area Code/Telephone No.: 
Concentration (if applicable): 
Admit Email: 
Student Signature: 
Date: 

Second Bachelor’s students are not eligible for the waiver listed below.

Please check the box next to the standards you are using to seek a waiver and attach the required documentation.

Standards:

- Have MA/MS, PhD, or JD from a US-accredited American University or an equivalent degree with coursework in the English language as evaluated by the Office of Graduate Dean (attach a copy of school transcript with degree noted).
- Published a refereed first – or single – authored academic journal article in the English language (attach a copy of the journal cover and first page of article with your name).
- Graduated with a baccalaureate degree or equivalent from a US-accredited University with a cumulative GPA of 3.7 or above (attach a copy of baccalaureate degree transcript).
- Received a 4.5 or higher on the analytical writing portion of the GRE/GMAT (attach verification).
- Instructor or instructor of a college-level writing course taught in the English language at a US-accredited University approved by the Office of Graduate Dean (attach verification).

Submit the waiver form and attachments to the Office of Graduate Studies. A review of your request will be undertaken, and you will be notified of the decision via email (correspondence will be sent to your Sacmail email).

Notes: Effective Fall 2010, Undergraduate GWAR does not satisfy the Graduate GWAR.

Waiver: □ Granted □ Denied

Graduate Dean: ___________________________ Date: __________

Office of Graduate Studies Comments: ___________________________

California State University, Sacramento
Office of Graduate Studies
East Point Center 206
500 J Street
Sacramento, CA 95819-5012
ADVANCEMENT TO CANDIDACY

1. File your “Application for Advancement to Candidacy” and submit your form before the University deadline (see http://www.csus.edu/gradstudies/). You should begin this procedure as soon as you have:
   - Removed any deficiencies in admission requirements and become fully classified;
   - Cleared the WPG requirement;
   - Completed at least 12 units of graduate level (200 series) Computer Science courses with a minimum 3.0 GPA AND have overall CSUS GPA 3.0 or better.

2. Application forms are available online (http://www.csus.edu/gradstudies/forms.htm).

3. Plan your degree program in consultation with your graduate advisor.

4. Read and follow the instructions on the application.

5. Your completed form must be signed by your Program Advisor & the Graduate Coordinator, who will then forward it to Graduate Studies for approval. (A copy will be sent to you by Graduate Studies once it has been approved.)

6. If you change your plan after it has been approved, you must file a “Petition for Exception.”

GUIDELINES FOR COMPLETING ADVANCEMENT TO CANDIDACY FORM
MASTER’S DEGREE

These guidelines must be followed in completing the Advancement to Candidacy form. This form lists the specific requirements (i.e., courses, exams, theses/projects) to be fulfilled before a Master’s degree can be awarded. When the advancement form is accepted and approved by the Graduate Dean, a student is officially advanced to degree candidacy. The student must submit three (3) copies (one original & two copies) of the signed form to the Office of Graduate Studies for processing.

1. Name: Do not omit. Submit a Data Change form for name changes – keep-up records current.
2. Enter your Student Identification number (Sac State ID)
3. Address: ‘Alert Graduate Center’ & staff address changes. Keep your address current. You could miss important notices or your diploma may be mailed to an old address.
4. Phone: Cell - We may need to contact you with questions about your record.
5. Major (i.e., Economics, Psychology, Counseling, Social Work)
6. Concentration (i.e., Finance, Creative Writing) - Do not list areas of study such as Software Engineering for Computer Science.
7. Catalog: Enter catalog years used in listing courses completed (i.e., 2006 - 13 catalog). All required courses listed in the catalog must be accounted for on the Advancement form (i.e., a course substitution is made, it should be noted on an asterisk (*) in the Advancement form). After the Advancement to Candidacy form has been approved by the Graduate Dean, all changes must be submitted for approval on a Petition for Exception.
8. Check if Graduate Writing Requirements have been completed. The writing proficiency requirement must be satisfied according to University policy before a student may advance to candidacy. Effective Fall 1999, students admitted to the University may not use CEST 1002 in the English Diagnostic Test as a waiver for the Writing Proficiency Requirement.
9. List advisor and committee members. Please print first and last names. Members who are non-tenured or tenure-track faculty must receive approval from the Graduate Dean to serve on the Master’s Committee.
10. List the core courses as listed in the catalog you are using - Any substitutions to the core courses must be noted, and a rationale provided on a separate sheet.
11. List the courses below for the area of study: electives, or concentrations. If more space is needed to list courses, a Page 2 form is available at the Office of Graduate Studies, some Department offices or at www.csus.edu/gradstudies. Must submit three (3) copies of the form with signatures.
12. List the Culminating Experience you will be completing (e.g., Dent 990) - Include number of units to be taken.
13. Sign and Date the form
14. Advisor’s signature: If Special Major: The two committee members should sign on this line.
15. The Graduate Coordinator’s (faculty member) signature is required, except in the case of a Special Major. Special Major - Applicant should obtain the signatures of their Committee Members on line 14. The Graduate Dean serves as the Graduate Coordinator for Special Major students.

Office of Graduate Studies
Application for Advancement to Candidacy Master's Degree

1. Name: ____________________________ 2. ID: ____________________________
3. Address: ____________________________
4. Phone: ____________________________ (Primary) ____________ (Secondary) ____________
5. Major: ____________________________
6. Catalog: ____________________________
7. Writing Requirement Met? _______ Yes _______ No _______
8. Advisor: ____________________________

Committee Members:

10. List core courses needed for Master’s program

11. List courses for Concentration and/or Electives (see page 2 if necessary)

12. List Culminating Experiences - check one: D Thesis 0 Project 0 Exam 0

13. Applicant’s Signature: ____________________________ Date: ____________________________

'98-99 CSUS Sample Form

Approved Date: ____________________________

Units Completed: ____________________________

Field of Study: ____________________________

Signature of Graduate Coordinator: ____________________________
1. An MS project must be original work.

2. MS projects are academic publications, which are public information. A work-related project must first resolve any intellectual property issues before it starts.

3. Completed work in any context other than an MS project should not be used to enroll into CSc 502.

4. A course project should not be used to enroll into CSc 502 unless there is a significant extension (of the work previously done) and approval by both the project supervisor and the original course instructor.

5. Students should choose their MS project supervisors carefully. In particular, students are encouraged to select faculty members with expertise in their MS project topic areas.

6. The oral presentation must be on the same project used toward the degree completion.

7. Project completion should be based on the quality of the project judged by the project committee. Other factors such as job commitment should not be used as excuses for demanding completion.

8. Each student is required to do an individual oral presentation.

9. Each student is required to write an individual MS project report and complete an “Academic Integrity Statement on Master’s Project/Thesis.”

10. Students should follow other established guidelines for changing project supervisors and for completing the oral presentation requirement.
THESIS/PROJECT ENROLLMENT AND COMPLETION

1. You must have met the following requirements before you will be allowed to enroll in CSC 500/502:
   a. You have been advanced to candidacy (refer to requirements);
   b. You have completed CSC 209;
   c. You have a thesis/project topic and proposal, a faculty supervisor and a second reader (or committee if doing a thesis);
   d. You have submitted an “MS Thesis/Project Topic” form, approved by your faculty supervisor and second reader, to the Graduate Coordinator, with your proposal, methodology and timetable attached;
   e. You have submitted a “Supervisory Course Petition,” approved by your faculty supervisor, to the Graduate Coordinator. (You cannot register yourself; the department will register you after the Graduate Coordinator approves your petition.)

2. You must complete an oral presentation of your project or an oral defense of your thesis before you can graduate.
   a. You may present your MS project at the department’s Graduate Symposium held every semester, a separately scheduled seminar, a professional conference, or a graduate-level course with prior approval of both your project advisor and the course instructor; note that the oral presentation must be on the same project used for your degree completion.
   b. For an MS thesis, you must schedule an oral defense.

3. Your final written report must be approved by your faculty supervisor and second reader (or committee), and be submitted to the Graduate Coordinator for approval TEN WORKING DAYS BEFORE THE OFFICE OF GRADUATE STUDIES DEADLINE.
   a. Work with your supervisor to ensure timely submission of drafts in order to meet this deadline. Be sure to follow the “CSUS Guide for Thesis Format” (see http://www.csus.edu/gradstudies/);
   b. During this process, you must complete and submit an “Academic Integrity Statement on Master's Project/Thesis” to your first reader.
   c. After the Graduate Coordinator signs it, take your final thesis or project report to the Office of Graduate Studies with the Thesis/Project Receipt form and Microfilming and Binding Receipt (also available from the Graduate Studies website).

4. If you cannot finish your project or thesis within one semester, you must continue enrollment:
   a. If you are an international student who needs course credit in order to maintain your visa, submit a “Supervisory Course Petition” for CSC 299 (one unit/semester), with your faculty supervisor’s signature, to the Graduate Coordinator. You cannot register yourself; the department will register you after the Graduate Coordinator approves your petition.
   b. If you are a domestic student or an international student doing Optional Practical Training, register for CSC 599, “Continuous Enrollment,” with the Office of Graduate Studies. You will only have to pay College of Continuing Education fees. After three semesters of CSC 599, if you still cannot finish your project or thesis, you must re-enroll in CSC 500 or 502 and pay full fees.
THESIS/PROJECT TOPIC FORM
MS in COMPUTER SCIENCE – MS in SOFTWARE ENGINEERING

<table>
<thead>
<tr>
<th>Student's Name:</th>
<th>SAC STATE ID:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Street Address:</td>
<td>City, State, Zip:</td>
</tr>
<tr>
<td>Tel. No. (work):</td>
<td>Email Address:</td>
</tr>
<tr>
<td>Tel. No. (home):</td>
<td>Faculty Sponsor:</td>
</tr>
<tr>
<td>Topic Title:</td>
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</table>

Description of proposed project/thesis (*provide a typewritten attachment*).
Outline of Methodology and Timetable (*provide a typewritten attachment*).
Faculty Sponsor's Comments (*If thesis, please also explain how it qualifies as a thesis*):

Faculty Sponsor's Signature: __________________________________________ Date: _____________
Second Reader's Signature: __________________________________________ Date: _____________
Third Reader's Signature (thesis only): ________________________________ Date: _____________

**If you are changing your faculty sponsor, the signature of the previous sponsor on file is required.**

Previous Faculty Sponsor’s Signature: ________________________________ Date: _____________
Graduate Coordinator's Signature: ________________________________ Date: _____________

**IMPORTANT INFORMATION REGARDING YOUR MASTER’S THESIS OR PROJECT**
(Please check one box and read all instructions)

- **Project**: You are required to make an oral presentation on your MS project, which can reflect your project work at any stage (preliminary, in progress, or near completion). You should present it in one of the following forums: (1) the Graduate Student Symposium organized once every semester; (2) a graduate level course with prior approval of both your project advisor and the course instructor; or (3) a professional conference. It is recommended that if you plan to leave the Sacramento area before you complete your project, you conduct your oral presentation before you leave.

  In which semester do you plan to complete your oral presentation requirement? ________________

- **Thesis**: You are required to defend your thesis in a separately scheduled seminar.

  The department-level deadline each semester for submitting an MS project report or thesis to the Graduate Coordinator’s Office, *already approved and signed by the Committee Chair and its members*, is 10 working days before the University (Office of Graduate Studies) deadline. Please include this deadline in your timetable.

  Student Signature: __________________________________________ Date: _____________

  Have you received credit for CSc 209?  Yes _____ No _____ Semester Taken: ________________
Computer Science Department
SUPERVISORY COURSE PETITION
For CSc 198, 199, 299, 500, 502

Note: Do not use this form for CSc 195/295 (use the “Student Internship” form instead) or CSc 195A-D (go to the Career Center in Lassen Hall Room 2000 to apply and register instead).

<table>
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<tr>
<th>Name</th>
<th>Semester/Yr</th>
<th>SAC STATE ID #</th>
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Email Address

(Be sure it is complete and legible.)

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Grading

- Lab Assistant
- Other

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<th>No. of Units</th>
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Area of study

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Area of study

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(718) Master's Thesis

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(718) Master's Project

Other:

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<th>Csc ____</th>
<th>No. of Units</th>
<th>Faculty Supervisor</th>
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Description

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APPROVED:

Faculty Supervisor’s Signature

(Other) Date __________

Department Chair’s Signature

(CSc 198, 199) Date __________

Grad Coordinator’s Signature

(CSc 299, 500, 502) Date __________

FOR DEPARTMENT USE ONLY:

Registered by___________ Date___________
Completion of Oral Presentation of MS Project

I have presented my MS Project.

Student name: ________________________________

Student signature: ___________________________

Title of presentation: _________________________

Date of presentation: ______

Location of presentation: _____________________

Project Advisor signature: _____________________

Graduate Coordinator signature: ________________

This form must be signed and submitted to the department no later than the submission of the final MS Project Report.
Academic Integrity Statement on Master’s Project/Thesis

I, _________________________________ (student name), certify that I have read, understood, and followed the University’s rules of academic integrity posted at http://www.csus.edu/umanual/AcademicHonestyPolicyandProcedures.htm in conducting my project/thesis work. My Master’s project/thesis work is original, and each and every use of existing work is cited with proper reference.

Printed Name of Student: ______________________________________________

Signature of Student: __________________________________________________

Date: _______________________________
CONTINUOUS ENROLLMENT

Graduate students who have been advanced to candidacy and who have completed all course work can maintain the required active degree program status without additional University registration by enrolling in CSC 599 (“Continuous Enrollment”) through Open University. (There are no units associated with this enrollment, so students who need units to maintain visa status should enroll in CSC 299 instead.) Enrolling in 599 requires a College of Continuing Education fee equal to one unit. Students are allowed a maximum of three semesters in 599 after first registering in 500/502 for a semester. A grade of “RP” will appear on their records as long as satisfactory progress is made toward completion and “continuous enrollment” is maintained. Students who do not complete the culminating experience within a total of four semesters will receive No Credit (“NC”) grades which cannot be removed from their records. They may re-enroll in 500/502 within the next two semesters and pay University fees in order to continue, as long as their 7-year deadline has not expired.
PETITION FOR EXCEPTION

If you change your “Advancement to Candidacy” plan after it has been approved (including changing from thesis to project), you must file a “Petition for Exception.”

Office of Graduate Studies

Petition for Exception

Sac State ID: ____________________________ Telephone: ____________________________

Legibly PRINT name and address below:

__________________________ ____________________________

Advisor:

Class Level (Check one):

☐ Undergraduate

Expected graduation Date:

☐ Graduate (Indicate Unclassified or Name of Degree Program):

Print Name

Committee Members:

Print Name

Print Name

☐ Course Substitutions: Previous Course/Units:

New Course/Units:

☐ Request graduate credit for excess undergraduate courses taken in semester of graduation. Courses must be in excess of Bachelor’s degree, no more than 6 units are allowed to be used towards a Master’s degree. List course name, number, and unit value (i.e., CE232 - Stability of Structures, 3 units)

☐ Change from (check one):

☐ Thesis to Project

☐ Project to Thesis

☐ Thesis/Project to Comprehensive Exam

☐ Comprehensive Exam to Thesis/Project

☐ Change in Special Major Advisor or Committee. New committee members must print & sign in the approval section below.

Previous Committee Member(s):

New Committee Member(s):

☐ Change in Dissertation/Thesis/Project Advisor. Previous and new member must print & sign in the approval section below:

Previous Dissertation/Thesis/Project Advisor: ____________________________ Date: ______

New Dissertation/Thesis/Project Advisor: ____________________________ Date: ______

Student’s Signature: ____________________________ Date: ____________________________

FOR DEPARTMENT / OFFICE OF GRADUATE STUDIES APPROVAL

Departmental Approval: ____________________________

Petition: ☐ Granted ☐ Denied

Faculty Advisor: ____________________________ Date: ______

Graduate Dean: ____________________________ Date: ______

* Faculty Advisor: ____________________________ Date: ______

* Graduate Coordinator / Sponsor: ____________________________ Date: ______

* Site and Advisor and Faculty/Advisor signatures required for Special Majors only

* Signature must be a tenure or tenure-track faculty member.
PETITION FOR CURRENCY

If completing your plan takes longer than expected, you may need to file a Petition for Currency. Course credit is valid for seven years only.

Section One

<table>
<thead>
<tr>
<th>Student Name:</th>
<th>Student ID:</th>
</tr>
</thead>
</table>

Currency Certification requested for (list only one course):

Instructor Of Record: ___________________ Grade: ___________________

Semester Course Completed: 
- [ ] Spring
- [ ] Summer
- [ ] Fall
- [ ] Winter
Year: ______

Plan to complete Culminating Experience work: _____ (list term)

Note: One course PER form

Section Two

Certifying Faculty to Complete This Section

Faculty Name: ________________________

If you are NOT the Instructor of Record for this course, PLEASE CHECK ONE of the following boxes and complete as appropriate:

- [ ] I last taught this course in: 
  - [ ] Spring
  - [ ] Summer
  - [ ] Fall
  - [ ] Winter
  Year: ______

- [ ] I have never taught this course, but I am competent to certify the student’s currency in this course for the following reasons.
  ____________________________
  ____________________________

Section Three

For Department / Office of Graduate Studies Approval

Departmental Approval**:
- [ ] Petition: 
  - [ ] Granted
  - [ ] Denied

Faculty Advisor: ___________________ Date: ______

Dean, Graduate Studies: ___________________ Comments: ___________________

Graduate Coordinator (Faculty): ___________________ Date: ______

Department Chair: ___________________ Date: ______

** Graduate Coordinator must be a tenured tenure-track faculty member.

* Must attach oral exam questions / written responses or professional documents
APPLICATION FOR GRADUATION

GRADUATION APPLICATION
GENERAL INFORMATION

Please read the information below before completing the Graduation Application $63.50 fee at the Student Financial Services Center before submitting the form to the Office of Graduate Studies (River Front Center, Room 206). Please read the information below before completing the graduation application.

- Due Dates: Return this form to the Office of Graduate Studies by the date noted below, if you want to have your name in the Commencement program:
  - October 1 for Fall graduation
  - February 1 for Spring or Summer graduation

- Changes to Graduation Application - Make a copy of this application for your records. If you have changes, please visit the Office of Graduate Studies, River Front Center, Room 206.

- Approved Advancement to Candidacy - If you do not have an approved Advancement to Candidacy form on file with the Office of Graduate Studies, your Application for Graduation will be returned to you.

- Change in Graduation Date: If you do not graduate the semester you specified on the application, then you must notify the Office of Graduate Studies, River Front Center, Room 206. An additional fee may be required.

- Change in Course Work – A Petition for Exception is required if you have made changes in any course work listed on your Advancement to Candidacy. Also, be sure you have listed and enrolled in the correct culminating requirement and units (i.e., SUBJ 500 or Ed.D. 617). You must be currently enrolled in the term you graduate.

- Diploma Mailing Address - You will receive your diploma approximately four (4) months after graduation. Note: If your address is different than the one listed on this form, you must file a “Data Change Form” with the Office of Graduate Studies or update your records on your My Sac State account.

- Approval Signature – Obtain the signature of your Graduate Coordinator, Department Chair or Faculty Advisor (Special Majors will require the signature of the faculty sponsor) and one additional committee member.

- Commencement Participation - If you wish to participate in commencement, please contact the ASI Business Office located on the 3rd floor of the University Union (278-7916) at least one (1) month before commencement for cap and gown information.
Office of Graduate Studies

Application for Graduation
Masters or Doctoral Degree

Please pay the $63.50 graduation and diploma fee(s) at the Financial Services Office BEFORE submitting to the Office of Graduate Studies.

Due October 1 (Fall) and February 1 (Spring or Summer)

Read each section carefully to avoid mistakes and delays.

1. Check appropriate degree classification:
   - [ ] MA
   - [ ] MS
   - [ ] MM
   - [ ] MBA
   - [ ] MPT
   - [ ] MSW
   - [ ] MPPA
   - [ ] Ed.D.
   - [ ] Ed.S.
   - [ ] DPT

2. Enter appropriate authorized major:

3. Concentration (if applicable) - List only approved Concentrations as listed in the catalog (Do not list Areas of Study):

4. Name: [ ] Ms. [ ] Mr. [ ] Dr. [ ] Other: ____________________
   Name on Diploma (legal name used while attending the university):

   **FIRST Name** [ ] **Middle** [ ] **LAST Name**

   **Diploma Mailing Address:** Your diploma will be sent to the address below. If you move before graduation, please complete a "Data Change Form" and return it to the Office of Graduate Studies (River Front Center - Room 205).

5. Address: __________________________________________________________

   Phone: ___________________________ Email: ___________________________

6. Signature: _______________________________________________________

7. Graduation Date: [ ] Spring [ ] Summer [ ] Fall Year: __________


10. Approved:

   Faculty Advisor: ___________________________ Date: ____________

   Signature of Graduate Coordinator or Department Chair (see back for more detail): ___________________________ Date: ____________

**For Use in Graduation Checkout**

<table>
<thead>
<tr>
<th>Date Advanced to candidacy</th>
<th>Course Curnency Exp:</th>
<th>Degree Conferral Date:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date Qual ifed Exam:</td>
<td>Degree Conferral Date:</td>
<td></td>
</tr>
<tr>
<td>Date Dissertation Defense:</td>
<td>Degree Conferral Date:</td>
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</tr>
<tr>
<td>Date Dissertation Filed:</td>
<td>Degree Conferral Date:</td>
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<tr>
<td>Date Thesis Filed:</td>
<td>Degree Conferral Date:</td>
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<tr>
<td>Date Project Filed:</td>
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</tr>
<tr>
<td>Date MA Comp. Exam:</td>
<td>Initials:</td>
<td></td>
</tr>
</tbody>
</table>

Fall 05
SUMMARY OF MS DEGREE COMPLETION AND GRADUATION

- Complete all coursework with a minimum 3.0 GPA (in 30 units of MS Program and CSUS overall GPA) and no grade lower than a “C” in the 30 units of Graduate program;

- Complete your MS thesis or project, including the oral presentation or defense and the statement of academic integrity; register for “continuous enrollment” if necessary;

- Complete both of the above within seven years;

- Complete and file all required paperwork as outlined in this handbook, including your “Application for Graduation with a Master’s Degree”;

- If you plan to attend Commencement, sign up in the ECS Dean’s Office to have your name included in the printed program;

- Your degree will be posted to your transcript 4-6 weeks after the end of the semester. Your diploma will be mailed to you approximately three months after graduation. (Be sure to file a data change form with the Office of Graduate Studies if you change your
DEGREE REQUIREMENTS – MS in Computer Science

The Master of Science in Computer Science requires completion of 30 units of course work, including at least 21 units of 200-level and 500-level courses, with a minimum 3.0 GPA. Only those courses completed within seven years prior to date of graduation will satisfy course requirements. An outline of degree requirements follows:

A. Required Courses (13 units)
   (3) CSC 201 Programming Language Principles (fully classified graduate status in Computer Science or Software Engineering)
   (3) CSC 204* Data Models for Database Management Systems (fully classified graduate status in Computer Science or Software Engineering)
   (3) CSC 205* Computer Systems Structure (fully classified graduate status in Computer Science, Software Engineering, or Computer Engineering)
   (3) CSC 206 Algorithms and Paradigms (fully classified graduate status in Computer Science or Software Engineering)
   (1) CSC 209 Research Methodology (fully classified graduate status in Computer Science or Software Engineering, a passing score on the WPG, completion of at least 12 units of 200-level courses in CSC)

*Students whose undergraduate preparation has covered a significant amount of the material in CSC 204 or 205 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 of Restricted Electives, described in Section C below.

B. Breadth Requirement (9 units)
   Select one course from three of the following areas:

   Computer Architecture/Computer Engineering
   CSC 237 Microprocessor Systems Architecture (CSC 205)
   CSC 242 Computer-Aided Systems Design and Verification (CSC 205 or CSC/EEE 273)
   CSC 273 Hierarchical Digital Design Methodology (CSC 205 or CPE 64 or equivalent)
   CSC 280 Advanced Computer Architecture (CSC 205 and fully classified graduate status in Computer Science or Software Engineering)

   Database Management Systems
   CSC 212 Bioinformatics: Data Integration and Algorithms (CSC 130, STAT 50, and graduate status; BIO 10 recommended)
   CSC 244 Database System Design (CSC 174 or CSC 204)

   Information Assurance and Security
   CSC 250 Computer Security (fully classified graduate status in Computer Science, Software Engineering, or Computer Engineering)
   CSC 252 Cryptography Theory and Practice (fully classified graduate status in Computer Science, Software Engineering, or Computer Engineering)
   CSC 253 Computer Forensics (fully classified graduate status in Computer Science, Software Engineering, or Computer Engineering)
   CSC 254 Network Security (fully classified graduate status in Computer Science, Software Engineering, or Computer Engineering)

   Intelligent Systems
   CSC 214 Knowledge-Based Systems (fully classified graduate status in Computer Science or Software Engineering)
   CSC 215 Artificial Intelligence (fully classified graduate status in Computer Science, Software Engineering, or Computer Engineering)
   CSC 219 Machine Learning (fully classified graduate status in Computer Science, Software Engineering, or Computer Engineering)

   Networks and Communications
   CSC 255 Computer Networks (fully classified graduate status in Computer Science, Software Engineering, or Computer Engineering)
CSC 258 Distributed Systems (CSC 204 and fully classified graduate status in Computer Science, Software Engineering, or Computer Engineering)

CSC 275 Advanced Data Communication Systems (fully classified graduate status in Computer Science, Software Engineering, or Computer Engineering)

**Software Engineering**

CSC 230 Software System Engineering (fully classified graduate status in Computer Science or Software Engineering; OR fully classified graduate status in Computer Engineering and CSC 131)

CSC 231 Software Engineering Metrics (fully classified graduate status in Computer Science or Software Engineering)

CSC 232 Software Requirements Analysis and Design (fully classified graduate status in Computer Science or Software Engineering)

CSC 233 Advanced Software Engineering Project Management (fully classified graduate status in Computer Science or Software Engineering)

CSC 234 Software Verification and Validation (fully classified graduate status in Computer Science or Software Engineering; OR fully classified graduate status in Computer Engineering and CSC 131)

CSC 235 Software Architecture (fully classified graduate status in Computer Science or Software Engineering)

CSC 236 Formal Methods in Secure Software Engineering (fully classified graduate status in Computer Science or Software Engineering)

CSC 238 Human-Computer Interface Design (fully classified graduate status in Computer Science or Software Engineering)

**Systems Software**

CSC 239 Advanced Operating System Principles and Design (CSC 205)

CSC 245 Performance Modeling and Evaluation (fully classified graduate status in Computer Science or Software Engineering)

CSC 250 Computer Security (fully classified graduate status in Computer Science, Software Engineering, or Computer Engineering)

CSC 251 Principles of Compiler Design (CSC 151 or CSC 201)

C. **Restricted Electives (3-6 units)**

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. One of the following upper-division courses: CSC 148, CSC 155, CSC 159, CSC 165, CSC 176, CSC 177, as long as they have not been used towards another degree. (A maximum of 6 undergraduate units may be used in any graduate program.)

2. 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 204 or CSC 205 must, for each course waived, take an additional three units in this category.

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.

D. **Culminating Requirement (2-5 units)**

Select one of the following:

CSC 500 Master's Thesis (CSC 209; advanced to candidacy) OR

CSC 502 Master's Project (CSC 209; advanced to candidacy)

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.

**NOTE:** Full course descriptions as well as other information about our graduate programs can be found on the web at: [www.ecs.csus.edu/csc](http://www.ecs.csus.edu/csc).
DEGREE REQUIREMENTS – MS in Software Engineering

The Master of Science in Software Engineering program covers the entire software application development process from problem definition through requirements, design, implementation, testing, operation, and maintenance. It requires completion of 30 units of course work, including a project or thesis in Software Engineering, with a minimum 3.0 GPA. Only those courses completed within seven years prior to date of graduation will satisfy course requirements. An outline of degree requirements follows:

A. Required Software Engineering Courses (21 units)

Select seven of the following eight courses:

(3) CSC 230  Software System Engineering (fully classified graduate status in Computer Science or Software Engineering; OR fully classified graduate status in Computer Engineering and CSC 131)
(3) CSC 231  Software Engineering Metrics (fully classified graduate status in Computer Science or Software Engineering)
(3) CSC 232  Software Requirements Analysis and Design (fully classified graduate status in Computer Science or Software Engineering)
(3) CSC 233  Advanced Software Engineering Project Management (fully classified graduate status in Computer Science or Software Engineering)
(3) CSC 234  Software Verification and Validation (fully classified graduate status in Computer Science or Software Engineering; OR fully classified graduate status in Computer Engineering and CSC 131)
(3) CSC 236  Formal Methods in Secure Software Engineering (fully classified graduate status in Computer Science or Software Engineering)
(3) CSC 235  Software Architecture (fully classified graduate status in Computer Science or Software Engineering)
(3) CSC 238  Human-Computer Interface Design (fully classified graduate status in Computer Science or Software Engineering)

B. Required Research Methodology (1 unit)

(1) CSC 209  Research Methodology (fully classified graduate status in Computer Science or Software Engineering, passing score on the WPG, completion of at least 12 units of 200-level courses in CSC)

C. Restricted Electives (3-6 units)

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. One of the following upper-division courses: CSC 148, CSC 155, CSC 159, CSC 165, CSC 176, CSC 177, as long as they have not been used towards another degree. (A maximum of 6 undergraduate units may be used in any graduate program.)
2. Any 200-level CSC courses not already used to satisfy Requirements A and B, 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 department approval and may not have been used in another program.

D. Culminating Requirement (2-5 units)

Select one of the following:

CSC 500  Master's Thesis (CSC 209; advanced to candidacy) OR
CSC 502  Master's Project (CSC 209; advanced to candidacy)

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 before the University deadline.

NOTE: Full course descriptions as well as other information about our graduate programs can be found on the web at: www.ecs.csus.edu/csc.
CERTIFICATES OF ADVANCED STUDY

The Certificates in Computer Science are designed to recognize students who have completed the core graduate courses – CSc 201, CSc 204, CSc 205 and CSc 206 – plus additional coursework in a specialty area. These certificates are available only for MS Computer Science matriculated students. Application forms are available in the department and on the department website at www.ecs.csus.edu/csc/ (select “Certificate Programs”).

Note: A grade point average of 3.0 must be attained for all courses taken in the program.

Certificate in Computer Architecture (9 units)
(3) CSC 242 Computer Aided Design Methodology for Computer Systems (CSC 205 or CSC 273)
(3) CSC 280 Advanced Computer Architecture (CSC 205 and fully classified graduate status in Computer Science or Software Engineering)
(3) Select one of the following:
   CSC 237 Microprocessor Systems Architecture (CSC 205)
   CSC 245 Performance Modeling and Evaluation (fully classified graduate status in Computer Science, Software Engineering, or Computer Engineering)
   CSC 258 Distributed Systems (CSC 204 and fully classified graduate status in Computer Science, Software Engineering, or Computer Engineering)
   CSC 273 Hierarchical Digital Design Methodology (CSC 205 or CPE 64 or equivalent)
   CSC 288 Special Topics in Computer Science – Computer Architecture/ Computer Engineering (fully classified graduate status in Computer Science or Software Engineering)

Certificate in Computer Engineering (9 units)
(3) Select one of the following:
   CSC 237 Microprocessor Systems Architecture (CSC 205)
   CSC 280 Advanced Computer Architecture (CSC 205 and fully classified graduate status in Computer Science or Software Engineering)
   EEE 285 Micro-Computer System Design II (CPE 186 or EEE 285)
(3) Select one of the following:
   CSC 242 Computer Aided Systems Design and Verification (CSC 205)
   CSC 273 Hierarchical Digital Design Methodology (CSC 205 or CPE 064 or equivalent)
(3) Select one of the following:
   CSC 159 Operating System Pragmatics (CSC 139)
   CSC 239 Advanced Operating System Principles and Design (CSC 205)

Certificate in Computer Networks and Communications (9 units)
(3) CSC 255 Computer Networks (fully classified graduate status in Computer Science, Software Engineering, or Computer Engineering)
(6) Select at least two of the following:
   CSC 254 Network Security (fully classified graduate status in Computer Science, Software Engineering, or Computer Engineering)
   CSC 258 Distributed Systems (CSC 204 and fully classified graduate status in Computer Science, Software Engineering, or Computer Engineering)
   CSC 275 Advanced Data Communication Systems (fully classified graduate status in Computer Science, Software Engineering, or Computer Engineering)
   CSC 288F Special Topics in Computer Science – Network Communication (fully classified graduate status in Computer Science or Software Engineering)

Certificate in Data Mining (9 units)
(3) CSC 177 Data Warehousing and Data Mining (CSC 134 and STAT 50)
(3) CSC 219 Machine Learning (fully classified graduate status in Computer Science, Software Engineering, or Computer Engineering)
(3) Select one of the following:
CSC 212  Bioinformatics: Data Integration and Algorithms (CSC 130, STAT 50, and graduate status; BIO 10 recommended)
CSC 244  Database Systems Design (CSC 174 or CSC 204)

Certificate in Data Management Systems (9 units)
(9) Select at least three of the following:
CSC 244  Database System Design (CSC 174 or CSC 204)
CSC 250  Computer Security (fully classified graduate status in Computer Science, Software Engineering, or Computer Engineering)
CSC 258  Distributed Systems (CSC 204 and fully classified graduate status in Computer Science, Software Engineering, or Computer Engineering)
CSC 288E  Special Topics in Computer Science – Database Management (fully classified graduate status in Computer Science or Software Engineering)

Certificate in Information Assurance and Security (9 units)
(9) Select at least three of the following:
CSC 236  Formal Methods in Secure Software Engineering (fully classified graduate status in Computer Science or Software Engineering)
CSC 250  Computer Security (fully classified graduate status in Computer Science, Software Engineering, or Computer Engineering)
CSC 252  Cryptography Theory and Practice (fully classified graduate status in Computer Science, Software Engineering, or Computer Engineering)
CSC 253  Computer Forensics (fully classified graduate status in Computer Science, Software Engineering, or Computer Engineering)
CSC 254  Network Security (fully classified graduate status in Computer Science, Software Engineering, or Computer Engineering)

Certificate in Intelligent Systems (9 units)
(3) CSC 215  Artificial Intelligence (fully classified graduate status in Computer Science, Software Engineering, or Computer Engineering)
(6) Select at least two of the following:
CSC 214  Knowledge-Based Systems (fully classified graduate status in Computer Science or Software Engineering)
CSC 219  Machine Learning (fully classified graduate status in Computer Science, Software Engineering, or Computer Engineering)
CSC 288B  Special Topics in Computer Science – Intelligent Systems (fully classified graduate status in Computer Science or Software Engineering)

Certificate in Software Engineering (9 units)
(9) Select at least three of the following:
CSC 230  Software System Engineering (fully classified graduate status in Computer Science or Software Engineering; OR fully classified graduate status in Computer Engineering and CSC 131)
CSC 231  Software Engineering Metrics (fully classified graduate status in Computer Science or Software Engineering)
CSC 232  Software Requirements Engineering (fully classified graduate status in Computer Science or Software Engineering)
CSC 233  Advanced Software Engineering Project Management (fully classified graduate status in Computer Science or Software Engineering)
CSC 234  Software Verification and Validation (fully classified graduate status in Computer Science or Engineering; OR fully classified graduate status in Computer Engineering and CSC 131)
CSC 235  Software Architecture (fully classified graduate status in Computer Science or Software Engineering)
CSC 236  Formal Methods in Secure Software Engineering (fully classified graduate status in Computer Science or Software Engineering)
CSC 238 Human-Computer Interface Design (fully classified graduate status in Computer Science or Software Engineering)

CSC 288D Special Topics in Computer Science – Software Engineering (fully classified graduate status in Computer Science or Software Engineering)

**Certificate in Systems Software** (9 units)

(3) CSC 239 Advanced Operating System Principles and Design (CSC 205)

(6) Select at least two of the following:

CSC 245 Performance Modeling and Evaluation (fully classified graduate status in Computer Science or Software Engineering)

CSC 250 Computer Security (fully classified graduate status in Computer Science, Software Engineering, or Computer Engineering)

CSC 251 Principles of Compiler Design (CSC 151 or CSC 201)

CSC 258 Distributed Systems (CSC 204 and fully classified graduate status in Computer Science, Software Engineering, or Computer Engineering)

CSC 288C Special Topics in Computer Science – Systems Software (fully classified graduate status in Computer Science or Software Engineering)

The department’s **Certificate in Web Development** is also available to fully classified graduate students in either Computer Science or Software Engineering, upon completion of the following two courses (no prerequisites required):

CSC 121 Client Side Web Programming

CSC 123 Web Application Development
Department of Computer Science
TENTATIVE TWO-YEAR SCHEDULE OF GRADUATE COURSES

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<th>MS in Computer Science: Required Courses</th>
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<th>MS in Computer Science: Breadth Requirement</th>
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<td>Required Research Methodology</td>
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Note: This is a planning document and not an implied guarantee that the schedule will be followed. Additional offerings of new graduate courses and experimental courses (296) may be scheduled as appropriate. CSC 295, 299, 500, and 502 are scheduled every term including Summer Session. The department reserves the right to cancel the class in the event that there is insufficient enrollment to financially justify the class. Please enroll early if you want the class.

Rev. 9/30/08
COMPUTER SCIENCE FACULTY AREAS OF INTEREST

Behnam Arad  
computer engineering, computer architecture, parallel processing, neural networks

Robert Buckley  
software engineering, structured programming, computer simulation, structural systems analysis and design, management science, project management, object-oriented programming, object-oriented analysis and design

Senad Busovaca  
robotics, nonlinear optimization, operating systems

Weide Chang  
speech and image recognition, embedded systems, intelligent interfaces and devices

John Clevenger  
operating systems, computer graphics, machine organization, VLSI design, programming contests

Nikrouz Faroughi  
computer architecture, computer-aided design testability, design validation

Isaac Ghansah  
speech and image recognition, embedded systems, intelligent interfaces and devices

V. Scott Gordon  
artificial intelligence, genetic algorithms, neural networks, programming languages, database design, game tree search, software engineering

Ying Jin  
application integration, database technology, object-oriented distributed computing, software engineering

Ted Krovetz  
cryptography, network security, algorithms, computing theory, computer architecture

Kwai-Ting Lan  
operating systems, computer architecture

Mary Jane Lee  
modeling and simulation, performance measurement and evaluation, human-computer interface

Meiliu Lu  
data mining, machine learning, bioinformatics technology

William Mitchell  
database management systems, software engineering, simulation

Martin Nicholes  
computer networking, computer architecture, security

Jinsong Ouyang  
manageability, security, and reliability of networking and distributed systems; embedded system design; network engineering; Web and Internet systems architecture, middleware, and application

Anne-Louise Radimsky  
artificial intelligence, knowledge-based systems, compilers, programming languages, education tools

Ahmed Salem  
software engineering, software testing, software process improvement, computer security

Chung-E Wang  
computer networks, data compression, Chinese OCR, design and analysis of algorithms

Cui Zhang  
software engineering, programming languages, formal methods, computer-aided specification and verification, information assurance and security

Du Zhang  
machine learning, knowledge-based systems, data mining, internet/web agents, bioinformatics