MS IN SOFTWARE ENGINEERING

In Workflow

1. CSC Committee Chair (tdk@csus.edu;%20jouyang@csus.edu)
2. CSC Chair (faroughi@csus.edu)
3. ECS College Committee Chair (troy.topping@csus.edu)
4. ECS Dean (kevan@csus.edu)
5. Academic Services (torsetj@csus.edu;%20212408496@csus.edu;%20cnewsome@skymail.csus.edu)
6. Senate Curriculum Subcommittee Chair (curriculum@csus.edu)
7. Dean of Undergraduate (james.german@csus.edu;%20celena.showers@csus.edu)
8. Dean of Graduate (cnewsome@skymail.csus.edu)
9. Catalog Editor (212408496@csus.edu;%20torsetj@csus.edu;%20cnewsome@skymail.csus.edu)
10. Graduate Studies (jdsmall@csus.edu)

Approval Path

1. Tue, 24 Sep 2019 06:51:33 GMT
   Jinsong Ouyang (jouyang): Approved for CSC Committee Chair
2. Wed, 25 Sep 2019 18:18:56 GMT
   Nikrouz Faroughi (faroughi): Approved for CSC Chair
3. Fri, 27 Sep 2019 17:49:01 GMT
   Troy Topping (troy.topping): Approved for ECS College Committee Chair
4. Fri, 27 Sep 2019 19:25:25 GMT
   Kevan Shafizadeh (kevan): Approved for ECS Dean

History

1. May 4, 2018 by clmig-jwehrheim

Date Submitted:Mon, 23 Sep 2019 23:38:54 GMT

Viewing:MS in Software Engineering

Last approved:Fri, 04 May 2018 16:52:46 GMT

Last edit:Fri, 27 Sep 2019 17:48:37 GMT

Changes proposed by: Haiquan Chen (219700833)

Academic Group: (College)

Engineering & Computer Science

Academic Organization: (Department)

Computer Science

Catalog Year Effective:

2020-2021 Catalog

Individual(s) primarily responsible for drafting the proposed degree major program:

Name (First Last)	Email	Phone 999-999-9999
Haiquan Chen	haiquan.chen@csus.edu	916-278-6087

Type of Program Proposal:

Major

Program Change Type:

Non-Substantive

Title of the Program:

MS in Software Engineering

Designation: (degree terminology)

Master of Science

Briefly describe the program proposal (new or change) and provide a justification:

CSC177 course title is updated to "Data Analytics and Mining" to be consistent with the recently submitted Form A for CSC177 course change. This course is in the notes of the Master's Program Requirements.

Objectives of the degree program:

1. Master, integrate, and apply advanced knowledge and skills to solve complex software engineering problems.
2. Produce quality technical and non-technical documents and presentations for a variety of audiences.
3. Demonstrate the ability to be creative and analytical, and to contribute to the discipline.
4. Demonstrate the ability to obtain, assess, and analyze developments and advancements in software engineering.
5. Adhere to ethical standards of the profession.
6. Recognize the social and global implications of his/her professional activities.

University Learning Goals

Graduate (Masters) Learning Goals:

Critical thinking/analysis
Communication
Disciplinary knowledge
Professionalism

Will this program be required as part of a teaching credential program, a single subject, or multiple subject waiver program (e.g., Liberal Studies, Biology) or other school personnel preparation program (e.g., School of Nursing)?

No

Catalog Description:

Total units required for MS: 30

Program Description

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

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

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

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

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

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

Admission Requirements: Course prerequisites and other criteria for admission of students to the degree major program, and for their continuation in it.

Admission Requirements

Admission as a classified graduate student requires:

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

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

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

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

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

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

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

Admission Procedures

Applicants must complete a university application and a separate departmental application by the posted application deadline dates for the term applying.*For more admissions information and application deadlines, please visit the Office of Graduate Studies*website *(*http://www.csus.edu/gradstudies/*)*:

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

Minimum Units and Grade Requirement for the Degree

Units Required for the MS: 30

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

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

Advancement to Candidacy

Each student must file an application for Advancement to Candidacy, indicating a proposed program of graduate study. This procedure should begin as soon as the classified graduate student has:

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

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

As defined by policyhttp://www.csus.edu/umanual/acadaff/fsm00010.htm, a change in units constitutes a substantive change to the program. If your changes constitute a substantive change, please refer back to the "Program Change Type" field above to ensure that "Substantive" is selected.

Program Requirements: (If new courses are being created as part of a new program, it will be useful to propose courses first.)

Program Requirements

Code	Title	Units
Required Software Engineering Courses (21 Units)		21
Select seven of the following:		21
CSC 230	Software System Engineering	
CSC 231	Software Engineering Metrics	
CSC 232	Software Requirements Analysis and Design	
CSC 233	Advanced Software Engineering Project Management	
CSC 234	Software Verification and Validation	
CSC 235	Software Architecture	
CSC 236	Formal Methods in Secure Software Engineering	

CSC 238	Human-Computer Interface Design	
Required Research Methodology (1 Unit)		
CSC 209	Research Methodology	1
Restricted Electives (3-6 Units)		
Select 3-6 units[1]		3 - 6
Culminating Requirement (2-5 Units)		
Select one of the following:		2 - 5
CSC 500	Master's Thesis[2]	
CSC 502	Master's Project[2]	
Total Units		30-33

[1] 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/CPE 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 course not already used to satisfy requirement A and B, with the exception ofCSC 295andCSC 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.

[2] 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.

For graduate programs, the number of declared undergraduate major and the degree production over the preceding years of the corresponding baccalaureate program:

The number of undergraduate majors in Fall 2014, Fall 2015, and Fall 2016 are 208, 259, and 360, respectively.

The number of degrees conferred in the baccalaureate program in 2014-15, 2015-16 and 2016-17 are 73, 86, and 141, respectively.

Fiscal Impact to Change an Existing Program

Indicate programmatic or fiscal impact which this change will have on other academic units' programs, and describe the consultation that has occurred with affected units:

No impact on department/college in terms of fiscal resources.

Provide a fiscal analysis of the proposed changes:

No impact on department/college in terms of fiscal resources.

How will the above changes be accommodated within the department/College existing fiscal resources?

No impact on department/college in terms of fiscal resources.

Will the proposed changes require additional resources?

No

What additional space, equipment, operating expenses, library, computer, or media resources, clerical/technical support, or other resources will be needed?

No impact on department/college in terms of fiscal resources.

Estimate the cost and indicate how these resource needs will be accommodated:

No impact on department/college in terms of fiscal resources.

Key: 150