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<!--mstheme-->College of Engineering and Applied Science<!--mstheme-->

<!--mstheme-->Department of Computer Science



<!--mstheme-->Guidelines for<!--mstheme-->

<!--mstheme-->Master of Engineering in Software Engineering

Last Updated: January 2021<!--mstheme-->



Complex software-intensive systems are permeating every aspect of our lives. These systems are among the most complex products humankind has ever tackled. Software systems engineering is the disciplined application of proven principles, techniques, and tools to the creation and maintenance of cost-effective, user friendly software systems that solve real problems. To accommodate the demand for well educated software engineers in almost all industries today, the University of Colorado at Colorado Springs has established the Master of Engineering degree in Software Systems Engineering. The University of Colorado at Colorado Springs offers a unique environment to study, learn, and share experiences surrounding this special engineering discipline. Our faculty comes from a broad spectrum of backgrounds. Many have had years of experience in industry prior to joining the faculty. The result is a diverse melting pot of ideas, technologies, and experiences. Courses at the graduate level (and the undergraduate courses required for admission to the graduate program) are regularly offered in the late afternoon and evening to enable students from local industry to continue their studies.

<!--mstheme-->I. Admission Requirements<!--mstheme-->

1. A Bachelor of Science or a Bachelor of Arts degree in mathematics, computer science, engineering, information systems, or equivalent.

2. An overall undergraduate grade point average of 3.0 (on a scale of 4.0; awarded within the past five years) **or** minimum 148 GRE quantitative. Applicants with a grade point average of less than 3.0 or an undergraduate degree awarded greater than five years ago will be admitted on a case by case basis. Applicants with a grade point average between 2.75 and 3.0 awarded within the past five years may be admitted provisionally.

3. It is recommended the applicant have two years experience with commercial, industrial or Government software development or maintenance.

4. A concise statement of experience and career goals.

5. Completed Admission Forms include two copies of official transcripts and references from four people to be sent the address below.

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Entering students must have the equivalent of the following UCCS courses
[CS 115](../../../courses/courses.html#CS145)0 Principles of Computer Science

[CS 145](../../../courses/courses.html#CS145)0 Data Structures and Algorithms
Math 2150 Discrete Mathematics
[CS 330](../../../courses/courses.html#CS330)0 Software Engineering

**Note:** These courses may have prerequisites.
**Note**: Any comparable course from another approved university will suffice.

**<!--mstheme-->II. Degree Requirements – 30 credit hours total**

*Required Courses – 15 credit hours*

CS-5300 Advanced Software Engineering

[CS-531](../../../courses/courses.html#CS531)0 Software Requirements
[CS-532](../../../courses/courses.html#CS532)0 Software Design
[CS-534](../../../courses/courses.html#CS534)0 Software Maintenance
[CS-535](../../../courses/courses.html#CS535)0 Software Project Management

*Degree Completion Courses – 15 credit hours*

One of:
[CS 700](../../../courses/courses.html#CS700)0 Thesis (6 credits) plus three elective courses;

CS 7010 Project (3 credits) plus four elective courses; OR

Project Portfolio (see description below) plus five elective courses

*Project Portfolio*

Portfolio Specification

This is a 5-10 page paper that describes at least one, and at most four, projects in which the student has been engaged.  For each project it will describe the overall project objectives, the team, the students’ role on the team, the formal software engineering/development methodology used, and the lifecycle stages in which the student was engaged. It should explicitly relate the project(s) to at least 2 of the MESE courses that the student has completed.  It should also include examples - at least one example work artifact from the software engineering process, with the artifact(s) not counting toward the 5 page minimum length.  The document should be a formal technical paper. It is recommended that students include appropriate references to relevant software engineering sources, such as books, papers and blogs.

Portfolio Timing
Students may submit their portfolio at any time after having completed 6 credits, and for work-related experience, it is strongly recommended it be submitted after completing 15-18 credits to allow the opportunity for taking one or more project intensive courses if the work experience is
not deemed sufficient.  In any case, the portfolio must be completed before the student can apply for graduation.  If the proposal/experience is deemed insufficient experience, the student will be required to take a software engineering project intensive course and then resubmit.  The program will ensure that a course designated as a software engineering project intensive course will be offered once per year, however a project intensive course may not be available every semester.

Portfolio Approval Process
The portfolio will be submitted to the MESE program adviser, in electronic form, with a copy to the department administrator. Review/analysis may take 2-4 weeks.  If confidential information is included as part of the project, this can be presented in a full/revised state in a review meeting. Prepare a 15 minute presentation to discuss your portfolio. In your presentation, explain your project, your specific work in the project, and how your MESE education has or has not supported the process you’ve conducted, and explain all artifacts. The MESE program adviser can either approve it directly, or may call for a committee of relevant faculty.  If minor revisions are requested, they may be resubmitted that term.  If the portfolio is rejected or requires major revisions, the student will have to complete a project intensive course before resubmission and hence the portfolio may not be resubmitted until completion of said course.

*Project*

The second option for program completion is the Project, worth 3 semester credit hours. There are two project options:

1. The project option may involve a large programming or hardware development effort, which is usually done over one semester, and includes the requirements and certification specifications and a user handbook. If the project will be completed with the assistance of others (in industry or through the College), meet with your Advisory Committee early to discuss your role in the project for approval.
2. Alternatively, the project option may involve producing a research paper, which is to be submitted for publication with the student and advisor as co-authors.

Given semester deadlines, it is highly recommended that you begin project work in the semester prior to project completion. Students intending to complete a project should be prepared to defend the project proposal very early in the semester of intended completion.

The format and content of the project report or paper are not controlled by University regulations but should follow the format of a thesis as described in the Thesis option. Students choosing the project option should develop a project proposal in conjunction with their major advisor that outlines the topics, scope, and objectives of the proposed project. The project topic will normally be in a common interest area to both the student and major advisor. The project proposal should be discussed with and approved by the student's MESE Advisory Committee before the student begins the work associated with the project. A signed copy of the proposal must be placed in the student's permanent file. The Computer Science Department should receive a copy of the project report for the departmental library. Additional copies are required for the project advisor and other members of the MESE Advisory Committee.

*Thesis*

Students who intend to write an MESE thesis should develop a thesis proposal in conjunction with their major advisor that outlines the topics, scope, and objectives of the proposed thesis. The thesis topic will normally be in a common interest area to both the student and the thesis advisor. The thesis proposal should be discussed with and approved by the student's MESE Advisory Committee before the student begins the research and writing of the thesis. A signed copy of the proposal must be placed in the student's permanent file.

The thesis should represent the best writing possible by the student and is not to be written or extensively edited by the student's major advisor. Original research work is praised though not necessary. Implementation and survey type theses are acceptable as is quality work related to the student's professional activities. However, the work must be accomplished while the student is enrolled in the master's program. The thesis is intended to furnish objective evidence of the student's ability to use independently and constructively the information, skills, and powers acquired in his/her graduate work. Students should begin writing their thesis early so there will be sufficient time for evaluation by the thesis advisor and rewriting by the student.

In mechanical features, all theses must comply with the specifications of the Graduate School. These specifications are contained in the document entitled "University of Colorado Graduate School Specifications for Preparation of Master's Theses and Doctoral Dissertations" which is available from the department. It is the student's responsibility to be familiar with this document so that a thesis acceptable to the Graduate School can be produced. This document specifies thesis form and standards, not technical content. Technical content is subject to the approval of the MESE Advisory Committee.

Two copies formally approved (signed) by two professors in computer science and including an approved abstract must be deposited with the UCCS Graduate School not less than two weeks before the end of the semester in which the degree is to be conferred. The Department of Computer Science requires one copy for the departmental library. Additional copies are required for the thesis advisor and other members of the MESE Advisory Committee.

*<!--mstheme-->****Elective Courses****<!--mstheme-->*

The electives may be any computer science course numbered 5020 or above. Up to two of the elective courses could be taken outside computer science if they are pre approved by the student’s advisory committee.
**Note:** Some courses may have prerequisites that do not earn credit towards degree.

<!--mstheme-->IIIIiii III. Degree Requirements<!--mstheme-->

1. An overall 3.0 grade point average in all graduate work.

2. All work applied to the degree must be accomplished within a six year time limit.

3. Up to 9 hours of graduate work may be transferred from an accredited graduate program at another institution or taken as a non-degree seeking student at UCCS, provided:

1. course work has not been used for any other degree,
2. grade earned for the course(s) is B or better,
3. the course work has been taken within past six years,
4. the course coverage is equal in level, content, and depth to the course for which is it being substituted.

4. All courses included to count for this degree must be part of an approved plan of study. This plan must be developed by the student and approved by his/her advisor prior to completing 12 credit hours of graduate course work.

*Advisory Committee*

Each new student will initially interact with a computer science graduate advisor. This will usually be the Program Director of the Masters of Engineering in Software Engineering.

As early as possible in the MESE program, the student must select a computer science graduate faculty member to serve as academic advisory, research director, and chairman of the student’s Advisory Committee. The formal acceptance and approval of advisor must be made prior to completion of the Plan of Study (must be submitted before completing 12 credits in the program). Prior to this, the MESE director will serve as advisor. In conjunction with this advisory, the student must invite at least two other graduate faculty members to serve as Advisory Committee members, with guidance from the chairman of the Advisory Committee. The Advisory Committee will provide any necessary direction to the student as well as be responsible for approving the Plan of Study and administering the final oral examination.

*Plan of Study*

The student, in consultation with his/her major advisor, must complete a Plan of Study consisting of at least 30 semester hours. **The Plan of Study must be submitted prior to the completion of 12 semester hours of graduate work.** This document specifies the courses and options chosen by the student and must be approved by the student’s Advisory Committee and the MESE director. With Advisory Committee approval, the Plan of Study may be changed during the course of the student’s graduate program.

*Final Oral Examination*

With either the Project or Thesis options, the student is required to pass an oral examination with the selected MESE advisory committee on work presented for the degree.

The final oral examination must be scheduled by the defense deadline issued by the UCCS Graduate School Office. If the student wrote a thesis, the examination will consist of a defense to the thesis and its foundations. If the student choses to do a project (CS 7010), the examination will consist of a defense of the project and its foundations. It is the responsibility of the Advisory Committee to administer the examination and to report the results to the Graduate School. It is the responsibility of the student to circulate a copy of the thesis or project report to each member of the Advisory Committee at least one week (preferably two weeks) in advance of the scheduled examination and to schedule the examination in concurrence with the Advisory Committee. This examination is open to the public.

If the student fails the final oral examination, the student may not attempt the examination again until at least three months have elapsed and until the student has covered such work as may be prescribed by the Advisory Committee. The student may retake the examination only once. If this examination is failed twice, the student will be terminated from the program.

A master’s degree student must be enrolled during the semester they intend to graduate. If all of the course work, including thesis or project credits have been completed, and the student only needs to defend, the student should register for CS 9990, “Candidate for Degree”.

*<!--mstheme-->*IV. Further Information*<!--mstheme-->*

For more information, call (719) 255-3544, visit our Web site at <http://eas.uccs.edu/cs/default.shtml>, e-mail csinfo@cs.uccs.edu or write:

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