Master of Science in Civil Engineering (MSCE)

Admission Requirements

See Admission Requirements for Graduate Degrees (http://catalog.uaa.alaska.edu/academicpoliciesprocesses/admissions/graduate/). All students must hold a baccalaureate degree in an engineering discipline or equivalent.

Accelerated MS in Civil Engineering Option

Bachelor of Science in Civil Engineering (BSCE) students interested in pursuing a Master of Science in Civil Engineering (MSCE) are encouraged to discuss the Accelerated MSCE Option with their academic advisor(s) and plan on applying for admission to the MSCE during their junior year. In addition to the Admission Requirements for Graduate Degrees listed above, the Accelerated MSCE Option applicant must:

1. Be admitted to the UAA BSCE.
2. Have completed at least 60% of the credits toward the BSCE Requirements.
3. Have a minimum grade point average (GPA) of 3.25 for all coursework credited toward the BSCE requirements.

Graduation Requirements

1. Complete the General University Requirements for Graduate Degrees (http://catalog.uaa.alaska.edu/graduateprograms/degreerequirements/).
2. Complete one of the following options, with approval in advance by the graduate advisor:
   - Thesis Option: 30 credits of course work including satisfactorily completing thesis work, of which at least 6 credits will be CE A699.
   - Project Option: 30 credits of coursework including satisfactorily completing a civil engineering project. At least 3 credits of the course work will be CE A686.
   - Comprehensive Exam Option: 30 credits of coursework and a comprehensive exam to be administered in the final semester of study.
3. Complete the program requirements below*.

* *Students admitted to the Accelerated MSCE option may apply up to six (6) credit hours of 600-level technical electives from their BSCE toward the graduation requirements of the MSCE.*

Program Requirements

Students must complete coursework in the core competency areas of Arctic, environmental, geotechnical, structures, transportation, or water resources engineering and one course in mathematics at the 400-level or higher, all with a minimum grade of B. Students electing to complete the project option or the comprehensive exam option must complete one 600-level course from the Engineering, Science and Project Management (ESPM) Department course offerings as part of their required course work. The remaining courses for any of the options shall be selected from any of the following emphasis areas or as approved by the student's graduate committee. Courses at the 400-level must be approved by the student's graduate committee.

Emphasis Areas

Students may choose to pursue a general MSCE. Alternatively, students may choose to pursue an MSCE with an emphasis area recognized on their transcript. Students will qualify for an MSCE with a sub-discipline emphasis by completing 15 credits of 600-level course work in one of the emphasis areas. Only one sub-discipline emphasis may be chosen for sub-discipline emphasis recognition. Graduate courses sorted by emphasis area are as follows:

Code	Title	Credits
Arctic		
AE A681	Frozen Ground Engineering	3
AE A682	Ice Engineering	3
AE A683	Arctic Hydrology and Hydraulic Engineering	3
AE A684	Arctic Utility Distribution	3
AE A685	Arctic Applications of Heat and Mass Transfer	3
AE A689	Cold Regions Pavement Design	3
Environmental		
AE A684	Arctic Utility Distribution	3
AEST A601	Aquatic Process Chemistry	3
CE A645	Chemical and Physical Water and Wastewater Treatment Processes	3
Geotechnical		
AE A681	Frozen Ground Engineering	3
AE A685	Arctic Applications of Heat and Mass Transfer	3
CE A610	Engineering Seismology	3
CE A611	Geotechnical Earthquake Engineering	3
CE A612	Advanced Foundation Design	3
CE A614	Soil Strength and Slope Stability	3
Structures		
AE A682	Ice Engineering	3
CE A631	Structural Finite Elements	3
CE A637	Earthquake Resistant Structural Design	3
CE A639	Loads on Structures	3
CE A651	Advanced Structural Analysis	3
CE A652	Advanced Steel Design	3
CE A654	Timber Design	3
Transportation		

AE A689	Cold Regions Pavement Design	3
CE A623	Traffic Engineering	3
CE A624	Pavement Design	3
CE A625	Highway Engineering	3
Water Resources		
AE A683	Arctic Hydrology and Hydraulic Engineering	3
CE A662	Surface Water Dynamics	3
CE A663	Ground Water Dynamics	3
CE A675	Design of Ports and Harbors	3
CE A676	Coastal Engineering	3
CE A677	Coastal Measurements and Analysis	3
CE A679	Sediment Transport and Coastal Processes	3

Thesis Option

The completed thesis must meet the following requirements:

1. The work must contribute to the body of knowledge in the candidate's field of graduate study. A literature review is required to show how the work is associated with the current state of the art in the candidate's field of graduate study.
2. The thesis should be of sufficient quality that it is publishable in a peer-reviewed journal, as judged by the graduate committee.
3. The work must demonstrate command of knowledge and skills associated with the candidate's field of graduate study.
4. The thesis proposal, submitted at least one semester prior to the thesis defense, must present evidence that the above requirements will be satisfied and will generally consist of an explicit problem statement, a literature review, and one or more sections describing the research and the analytical methods that will be applied.
5. The thesis must be defended by the student in an oral presentation to the student's graduate committee.

Civil Engineering Project Option

The civil engineering project will be conducted as an individual study and includes the following items that the student submits to the advisory committee:

1. Project proposal to be approved by the graduate advisory committee.
2. Draft project report to be reviewed by the graduate advisory committee. The report should consist of an introduction, literature review, methodology (if applicable), results, conclusions, recommendations, and references.
3. Final project report incorporating suggestions and improvements as prescribed by the graduate advisory committee.

Comprehensive Exam Option

The comprehensive exam shall be taken in the last semester of the degree program. Prior to the exam, the student and the student's advisor will review the coursework completed by the student as part of the Graduate Studies Plan. Aspects of that review will be used to create an exam based on four of the courses completed during the program.

The final decision on which courses are to be used for the exam will be made by the advisor.

The student and advisor will establish a period of time over which the exam will be taken. Additional requirements for the exam will be articulated to the student prior to the exam date.

Licensure and/or Certification

Graduates of the Master of Science in Civil Engineering gain one year of education credit toward obtaining a Professional Engineer license in Alaska.

Please go to UAA's Authorization by State (https://www.uaa.alaska.edu/academics/office-of-academic-affairs/uaa-state-authorization/authorization.cshtml/) website for information about licensure or certification in a state other than Alaska.

Program Student Learning Outcomes

In keeping with the program objectives, the expected student learning outcomes of the UAA MSCE program include:

- An ability to use advanced methods of analysis,
- An ability to understand advanced civil engineering theory,
- An ability to conduct advanced civil engineering research,
- An ability to apply advanced engineering theory to the design of civil engineering systems, and
- An ability to work effectively within the management framework of organizations responsible for the practice of engineering.