



# Arctic Engineering

College of Science, Engineering and Mathematics  
Department of Civil and Environmental Engineering  
(907) 474-7241

[www.uaf.edu/civileng/cee.html](http://www.uaf.edu/civileng/cee.html)

Degree: M.S.

Minimum Requirements for Degree: 30 credits

The arctic engineering program provides training for graduate engineers who must deal with the unique challenge of design, construction and operations in cold regions of the world. The special problems created by the climatic, geological and logistical conditions of the Arctic and subarctic require knowledge and techniques not usually covered in normal engineering courses.

Of primary importance is a thorough understanding of heat transfer processes. In addition, properties of frozen ground and frozen water are basic to most engineering activities in the Arctic. The areas of hydraulics, hydrology and utility operations are also uniquely affected by arctic considerations.

The arctic engineering program requires a set of core courses that prepares an engineer to understand and adapt to cold regions problems. It also allows the student to round out the program with advanced elective courses in a particular field of interest. Arctic engineering research activities carried out by faculty associated with this program can provide opportunities for theses or project papers dealing with the most current arctic knowledge.

The current development of petroleum and other natural resources has accentuated the demand for engineers with education in northern operations, both from the private industries that are involved in the development and from government agencies that must plan for or regulate this activity.

## GRADUATE PROGRAM

### Arctic Engineering—M.S. Degree

1. Complete the general university requirements (page 43).
2. Complete the master's degree requirements (page 46).
3. Complete at least 5 of the following core courses:
 

CE 681—Frozen Ground Engineering .....	3
CE 682—Ice Engineering (3)	
or GEOS 615—Sea Ice (3) .....	3
CE 683—Arctic Hydrology and Hydraulic Engineering .....	3
CE 684—Arctic Utility Distribution .....	3
ME 685—Arctic Heat and Mass Transfer .....	3
ME 687—Arctic Materials Engineering .....	3
4. CE 698 or 699—Thesis or Project .....
5. Electives \* .....
6. Minimum credits required .....

*\* All electives must be in areas related to or supportive of the student's degree program and approved by the student's graduate advisory committee.*

*Note: CE 603—Arctic Engineering is not an approved elective for the M.S. in Arctic Engineering.*

- See Civil Engineering.
- See Engineering for Ph.D. program.
- See Engineering Management.
- See Science Management.
- See Environmental Engineering and Environmental Quality Science.



# University of Alaska Fairbanks

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