M.S., CIVIL ENGINEERING

• Complete the following admission requirements:
  a. Complete a bachelor’s degree in engineering or natural sciences.¹
  b. Submit GRE scores.
  c. International students must complete the TOEFL with a score of 575 or better.

¹ If applying with a non-engineering degree, submit a Graduate Study Plan, including required deficiency courses, to be approved by a committee.

DEFICIENCY REQUIREMENTS ²

Fundamentals of Engineering Exam
MATH F251X Calculus I 4
MATH F252X Calculus II 4
MATH F253X Calculus III 4
MATH F302 Differential Equations 3
Two approved science courses 8
Three F200-level or above engineering courses
Four F400-level CE courses ³

² If taken before, these courses can be credited as deficiency courses as approved by the CEE department chair.
³ Two must be design classes in different fields of civil engineering.


Minimum Requirements for Degree: 30 credits

General University Requirements
Complete the general university requirements. (http://catalog.uaf.edu/graduate)

Master’s Degree Requirements
Complete the master’s degree requirements. (http://catalog.uaf.edu/graduate/#Masters)

Program Requirements
Complete a thesis or project 3-9
Complete comprehensive exam
Complete one from the following concentrations 21-27
- Arctic Engineering
- Environmental Engineering
- Engineering Design and Construction
- Geotechnical Engineering
- Structural Engineering
- Transportation Engineering
- Water Resources Engineering

Total Credits 24-36

ARCTIC ENGINEERING
CE F603 Arctic Engineering 3
CE F624 Frozen Ground Engineering 3

CE F682 Ice Engineering 3
or GEOS F615 Sea Ice
CE F683 Arctic Hydrology and Hydraulic Engineering 3
ME F685 or ME F642 Arctic Heat and Mass Transfer
Advanced Heat Transfer
Approved electives (6 credits for thesis; 12 credits for project) 6-12

Total Credits 21-27

¹ Recommended electives include: CE F422, CE F601, CE F625, CE F628, CE F635, CE F684, CE F685, MATH F460 and MATH F615.

ENVIRONMENTAL ENGINEERING
CE F601 Engineering Research Communication 3
ENVE F641 Aquatic Chemistry 3
or CHEM F605 Aquatic Chemistry
ENVE F645 Unit Processes: Chemical and Physical 3
ENVE F647 Biotechnology 3
Approved electives (9 credits for thesis; 15 credits for project) 9-15

Total Credits 21-27

¹ Recommended electives include: BIOL F567, CE F603, CE F663, CE F684, CHEM F609, CHEM F631, CHEM F655, ENVE F642, ENVE F643, ENVE F644, ENVE F646, ENVE F649, ENVE F652 and ENVE F658.

ENGINEERING DESIGN AND CONSTRUCTION
Personnel, leadership, business communications, marketing electives ¹
Design and construction management electives ² 6
Accounting, finance, economics electives ³ 3
Design and construction technical electives ⁴ 9
Project only:
- Select additional approved elective ⁵

Total Credits 27

¹ Recommended electives include: CE F601, CE F659A, ESM F601, MBA F607 and MBA F617.
² Recommended electives include: CE F620, CE F652C, CE F660A, ESM F608, ESM F609 and MBA F627.
³ Recommended electives include: ESM F605.
⁴ Recommended electives include: CE F451 and courses approved for graduate certificate program (http://catalog.uaf.edu/graduate/graduate-degree-programs/design-construction-management).
⁵ Recommended electives include: CE F603 and ENVE F644.

GEOTECHNICAL ENGINEERING
CE F605 Pavement Design 3
CE F622 Foundations and Retaining Structures 3
CE F624 Frozen Ground Engineering 3
CE F625 Soil Stabilization and Embankment Design 3
CE F627 Geotechnical Earthquake Engineering 3
CE F628 Unsaturated Soils Mechanics 3
### M.S., Civil Engineering

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CE F633</td>
<td>Theory of Elastic Stability</td>
<td>3</td>
</tr>
<tr>
<td>CE F635</td>
<td>Numerical Methods for Geomechanics and Soil-Structure Interaction</td>
<td>3</td>
</tr>
</tbody>
</table>

**Additional approved electives (6 credits for thesis; 12 credits for project)** | 6-12 |

**Total Credits** | 30-36 |

1. Recommended electives include: CE F422, CE F601, CE F603, CE F637, GE F440 and ME F601.

### STRUCTURAL ENGINEERING

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CE F601</td>
<td>Engineering Research Communication</td>
<td>3</td>
</tr>
<tr>
<td>CE F622</td>
<td>Foundations and Retaining Structures</td>
<td>3</td>
</tr>
<tr>
<td>CE F630</td>
<td>Advanced Structural Mechanics</td>
<td>3</td>
</tr>
<tr>
<td>CE F633</td>
<td>Theory of Elastic Stability</td>
<td>3</td>
</tr>
<tr>
<td>CE F634</td>
<td>Structural Dynamics</td>
<td>3</td>
</tr>
<tr>
<td>CE F635</td>
<td>Numerical Methods for Geomechanics and Soil-Structure Interaction</td>
<td>3</td>
</tr>
</tbody>
</table>

**Additional approved electives (6 credits for thesis; 12 credits for project)** | 6-12 |

**Total Credits** | 24-30 |

1. Recommended electives include: CE F631, CE F637, CE F640, CE F646 and CE F650.

### TRANSPORTATION ENGINEERING

**Approved engineering electives (9 credits for thesis; 15 credits for project)** | 9-15 |

**Additional approved electives** | 12 |

**Total Credits** | 21-27 |

1. Recommended engineering electives include: CE F601, CE F603, CE F605, CE F624, CE F682, ESM F621, ESM F622 and ME F631.

2. At least 3 credits must be in advanced mathematics or statistical methods. Recommended electives include: MATH F408, MATH F661, STAT F402, STAT F461, STAT F602, STAT F605 and STAT F611.

### WATER RESOURCES ENGINEERING

Select 12 credits from the following: | 12 |

<table>
<thead>
<tr>
<th>Course Code</th>
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<tbody>
<tr>
<td>CE F661</td>
<td>Advanced Water Resources Engineering</td>
</tr>
<tr>
<td>CE F662</td>
<td>Open Channel and River Engineering</td>
</tr>
<tr>
<td>CE F663</td>
<td>Groundwater Dynamics</td>
</tr>
<tr>
<td>CE F664</td>
<td>Sediment Transport</td>
</tr>
<tr>
<td>CE F683</td>
<td>Arctic Hydrology and Hydraulic Engineering</td>
</tr>
</tbody>
</table>

**Additional approved electives (9 credits for thesis; 15 credits for project)** | 9-15 |

**Total Credits** | 21-27 |

1. Recommended electives include: CE F445, CE F601, CE F603, CE F665, GEOS F616, GEOS F617, GEOS F694, NRM F435 and NRM F670.

See Engineering (http://catalog.uaf.edu/graduate/graduate-degree-programs/engineering) for Ph.D. program.