CIVIL ENGINEERING M.S.

Admission Requirements
Complete the following admission requirements:

- Complete a bachelor's degree in engineering or natural sciences.  
- Submit GRE scores.

1 If applying with a non-engineering degree, submit a graduate study plan, including required deficiency courses, to be approved by a committee.
2 The GRE requirement is waived for any applicant graduating with a 3.0 GPA or higher from an ABET-accredited CE or GE B.S. program.

DEFICIENCY REQUIREMENTS 2

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH F251X</td>
<td>Calculus I</td>
<td>4</td>
</tr>
<tr>
<td>MATH F252X</td>
<td>Calculus II</td>
<td>4</td>
</tr>
<tr>
<td>MATH F253X</td>
<td>Calculus III</td>
<td>4</td>
</tr>
<tr>
<td>MATH F302</td>
<td>Differential Equations</td>
<td>3</td>
</tr>
<tr>
<td>Two approved science courses</td>
<td></td>
<td>8</td>
</tr>
<tr>
<td>Three F200-level or above engineering courses</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Four F400-level CE courses 3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

Program Requirements
< Back to Department (https://catalog.uaf.edu/academic-departments/civil-geological-environmental-engineering/)

Minimum Requirements for Civil Engineering M.S.: 30 credits

CONCENTRATIONS: ARCTIC ENGINEERING (P. 1), DESIGN AND CONSTRUCTION MANAGEMENT, (P. 1) ENVIRONMENTAL ENGINEERING (P. 2), GEOTECHNICAL ENGINEERING (P. 2), STRUCTURAL ENGINEERING (P. 2), TRANSPORTATION ENGINEERING (P. 2), WATER RESOURCES ENGINEERING (P. 2)

Complete one of the following: 21-27

- Arctic Engineering
- Design and Construction Management
- Environmental Engineering
- Geotechnical Engineering
- Structural Engineering
- Transportation Engineering
- Water Resources Engineering

Total Credits 30-36

Concentrations

ARCTIC ENGINEERING

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CE F401</td>
<td>Arctic Engineering</td>
<td>3</td>
</tr>
<tr>
<td>CE F624</td>
<td>Permafrost Engineering</td>
<td>3</td>
</tr>
<tr>
<td>CE F682</td>
<td>Ice Engineering</td>
<td>3</td>
</tr>
<tr>
<td>or GEO F615</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ME F685</td>
<td>Arctic Heat and Mass Transfer</td>
<td>3</td>
</tr>
<tr>
<td>or ME F642</td>
<td>Advanced Heat Transfer</td>
<td></td>
</tr>
<tr>
<td>Approved electives (6 credits for thesis; 12 credits for project)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Credits</td>
<td></td>
<td>21-27</td>
</tr>
</tbody>
</table>

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

DESIGN AND CONSTRUCTION MANAGEMENT

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personnel, leadership, business communications, marketing electives 2</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Design and construction management electives 3</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Accounting, finance, economics electives 4</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Design and construction technical electives 5</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>Project only:</td>
<td>Complete additional approved elective 6</td>
<td></td>
</tr>
<tr>
<td>Total Credits</td>
<td></td>
<td>24-27</td>
</tr>
</tbody>
</table>

Recommended electives include CE F601, ESM F601, MBA F607 and MBA F617.
3 Recommended electives include CE F620, ESM F608, ESM F609 and MBA F627.
4 Recommended electives include ESM F605.
5 Recommended electives include CE F451.
6 Recommended electives include CE F401 and ENVE F644.

Complete the following:

General University Requirements
Complete the graduate general university requirements. (https://catalog.uaf.edu/masters/#gurmastrdegrestext)

Master's Degree Requirements
Complete the master's degree requirements. (https://catalog.uaf.edu/masters/#typesofmastersdegrees)

Civil Engineering Program Requirements
Complete a thesis or project 3-9
Complete comprehensive exam
Concentration
### ENVIRONMENTAL ENGINEERING

**Environmental Engineering Concentration Requirements**

Complete the following:

- CE F601 Engineering Research Communication: 3 credits
- ENVE F641 Aquatic Chemistry: 3 credits
- or CHEM F605 Aquatic Chemistry: 3 credits
- ENVE F645 Unit Processes: Chemical and Physical: 3 credits
- ENVE F647 Biotechnology: 3 credits

Approved electives (9 credits for thesis; 15 credits for project): 9-15 credits

Total Credits: 21-27

7 Recommended electives include BIOL F657, CE F401, CE F663, CE F684, CHEM F609, CHEM F631, CHEM F655, ENVE F642, ENVE F643, ENVE F644, ENVE F646, ENVE F649, ENVE F652 and ME F658.

### GEOTECHNICAL ENGINEERING

**Geotechnical Engineering Concentration Requirements**

Complete 15 credits from the following:

- CE F605 Pavement Design: 15 credits
- CE F622 Foundations and Retaining Structures
- CE F624 Permafrost Engineering
- CE F625 Soil Stabilization and Embankment Design
- CE F627 Geotechnical Earthquake Engineering
- CE F628 Unsaturated Soils Mechanics
- CE F633 Theory of Elastic Stability
- CE F635 Numerical Methods for Geomechanics and Soil-Structure Interaction

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

Total Credits: 21-27

8 Recommended electives include CE F401, CE F422, CE F601, CE F637, GE F440 and ME F601.

### TRANSPORTATION ENGINEERING

**Transportation Engineering Concentration Requirements**

Complete the following:

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

Additional approved electives: 12 credits

Total Credits: 21-27

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

### WATER RESOURCES ENGINEERING

**Water Resources Engineering Concentration Requirements**

Complete 12 credits from the following:

- CE F661 Advanced Water Resources Engineering
- CE F662 Open Channel and River Engineering
- CE F663 Groundwater Hydrology
- CE F664 Sediment Transport
- CE F683 Arctic Hydrology and Hydraulic Engineering

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

Total Credits: 21-27

12 Recommended electives include CE F401, CE F445, CE F601, CE F665, GEOS F616, GEOS F617, GEOS F694, NRM F435 and NRM F670.

### STRUCTURAL ENGINEERING

**Structural Engineering Concentration Requirements**

Complete 15 credits from the following:

- CE F601 Engineering Research Communication: 15 credits
- CE F622 Foundations and Retaining Structures
- CE F630 Advanced Structural Mechanics
- CE F633 Theory of Elastic Stability
- CE F634 Structural Dynamics
- CE F635 Numerical Methods for Geomechanics and Soil-Structure Interaction

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

Total Credits: 21-27

11 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.