

# CIVIL ENGINEERING M.S.

## Admission Requirements

Complete the following admission requirements:

- Complete a bachelor's degree in engineering or natural sciences.<sup>1</sup>
- Submit GRE scores.<sup>2</sup>

<sup>1</sup> If applying with a non-engineering degree, submit a graduate study plan, including required deficiency courses, to be approved by a committee.

<sup>2</sup> 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<sup>2</sup>

Code	Title	Credits
	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 <sup>3</sup>	

<sup>2</sup> If taken before, these courses can be credited as deficiency courses as approved by the department chair.

<sup>3</sup> 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)

Code	Title	Credits
<b>General University Requirements</b>		
Complete the graduate general university requirements. ( <a href="https://catalog.uaf.edu/masters/#gurmastersdegreestext">https://catalog.uaf.edu/masters/#gurmastersdegreestext</a> )		
<b>Master's Degree Requirements</b>		
Complete the master's degree requirements. ( <a href="https://catalog.uaf.edu/masters/#typesofmastersdegrees">https://catalog.uaf.edu/masters/#typesofmastersdegrees</a> )		
<b>Civil Engineering Program Requirements</b>		
	Complete a thesis or project	3-9
	Complete comprehensive exam	
<b>Concentration</b>		

Complete one of the following:	21-27
Arctic Engineering	
Design and Construction Management	
Environmental Engineering	
Geotechnical Engineering	
Structural Engineering	
Transportation Engineering	
Water Resources Engineering	
<b>Total Credits</b>	<b>30-36</b>

## Concentrations

### ARCTIC ENGINEERING

Code	Title	Credits
<b>Arctic Engineering Concentration Requirements</b>		
Complete the following:		
CE F401	Arctic Engineering	3
CE F624	Permafrost Engineering	3
CE F682	Ice Engineering	3
	or GEOS F615 Sea Ice	
CE F683	Arctic Hydrology and Hydraulic Engineering	3
ME F685	Arctic Heat and Mass Transfer	3
	or ME F642 Advanced Heat Transfer	
Approved electives (6 credits for thesis; 12 credits for project) <sup>1</sup>		6-12
<b>Total Credits</b>		<b>21-27</b>

<sup>1</sup> 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

Code	Title	Credits
<b>Design and Construction Management Concentration Requirements</b>		
	Personnel, leadership, business communications, marketing electives <sup>2</sup>	6
	Design and construction management electives <sup>3</sup>	6
	Accounting, finance, economics electives <sup>4</sup>	3
	Design and construction technical electives <sup>5</sup>	9
	Project only:	0-3
	Complete additional approved elective <sup>6</sup>	
<b>Total Credits</b>		<b>24-27</b>

<sup>2</sup> Recommended electives include CE F601, ESM F601, MBA F607 and MBA F617.

<sup>3</sup> Recommended electives include CE F620, ESM F608, ESM F609 and MBA F627.

<sup>4</sup> Recommended electives include ESM F605.

<sup>5</sup> Recommended electives include CE F451.

<sup>6</sup> Recommended electives include CE F401 and ENVE F644.

**ENVIRONMENTAL ENGINEERING**

Code	Title	Credits
<b>Environmental Engineering Concentration Requirements</b>		
Complete the following:		
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) <sup>7</sup>		9-15
<b>Total Credits</b>		<b>21-27</b>

<sup>7</sup> 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**

Code	Title	Credits
<b>Geotechnical Engineering Concentration Requirements</b>		
Complete 15 credits from the following:		15
CE F605	Pavement Design	
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) <sup>8</sup>		6-12
<b>Total Credits</b>		<b>21-27</b>

<sup>8</sup> Recommended electives include CE F401, CE F422, CE F601, CE F637, GE F440 and ME F601.

**STRUCTURAL ENGINEERING**

Code	Title	Credits
<b>Structural Engineering Concentration Requirements</b>		
Complete 15 credits from the following:		15
CE F601	Engineering Research Communication	
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) <sup>9</sup>		6-12
<b>Total Credits</b>		<b>21-27</b>

<sup>9</sup> Recommended electives include CE F631, CE F637, CE F640, CE F646 and CE F650.

**TRANSPORTATION ENGINEERING**

Code	Title	Credits
<b>Transportation Engineering Concentration Requirements</b>		
Complete the following:		
Approved engineering electives (9 credits for thesis; 15 credits for project) <sup>10</sup>		9-15
Additional approved electives <sup>11</sup>		12
<b>Total Credits</b>		<b>21-27</b>

<sup>10</sup> Recommended engineering electives include CE F401, CE F601, CE F605, CE F624, CE F682, ESM F621, ESM F622 and ME F631.

<sup>11</sup> 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**

Code	Title	Credits
<b>Water Resources Engineering Concentration Requirements</b>		
Complete 12 credits from the following:		12
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) <sup>12</sup>		9-15
<b>Total Credits</b>		<b>21-27</b>

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