CIVIL ENGINEERING B.S./M.S.

Admission Requirements
Complete the following admission requirements:

• CE major (junior preferred) or senior standing.
• A GPA 3.25 or above (based on a minimum of 24 credits in CE major requirements) is required for admission. Students must maintain a cumulative GPA of at least 3.0 to remain in the program.
• Submit three letters of reference.
• Submit GRE (general) scores.
• Submit a study goal statement.
• Submit a UAF graduate application for admission.

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

Minimum Requirements for Civil Engineering B.S./M.S. Degree: 144 credits

CONCENTRATIONS: ENVIRONMENTAL/WATER RESOURCES (P. 1), CIVIL INFRASTRUCTURE (P. 2)

Students must satisfy the General University Requirements for minimum grades for the respective B.S. or M.S. program (major) requirements.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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<tr>
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<td>General University Requirements</td>
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<td>Complete the general university requirements. (<a href="http://catalog.uaf.edu/bachelors/#gurbachelorsdegreestext">http://catalog.uaf.edu/bachelors/#gurbachelorsdegreestext</a>)</td>
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<td>General Education Requirements</td>
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<td>CHEM F105X</td>
<td>General Chemistry I</td>
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<tr>
<td>CHEM F106X</td>
<td>General Chemistry II</td>
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<td>MATH F251X</td>
<td>Calculus I</td>
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<td>B.S. Degree Requirements</td>
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<td>Complete the B.S. degree requirements. (<a href="http://catalog.uaf.edu/bachelors/#bachelorofsciencentext">http://catalog.uaf.edu/bachelors/#bachelorofsciencentext</a>)</td>
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<td>MATH F252X</td>
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<td>PHYS F211X</td>
<td>General Physics I</td>
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<tr>
<td>PHYS F212X</td>
<td>General Physics II</td>
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<td>Undergraduate Civil Engineering Program Requirements</td>
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<td>Complete the following:</td>
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<tr>
<td>CE F112</td>
<td>Elementary Surveying</td>
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<td>or MIN F202</td>
<td>Surveying and CAD for Engineers</td>
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<tr>
<td>CE F302</td>
<td>Fundamentals of Transportation Engineering</td>
<td>3</td>
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<tr>
<td>CE F326</td>
<td>Introduction to Geotechnical Engineering and Foundations</td>
<td>4</td>
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<tr>
<td>CE F331</td>
<td>Structural Analysis</td>
<td>3</td>
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<tr>
<td>CE F334</td>
<td>Properties of Materials</td>
<td>3</td>
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<td>CE F341</td>
<td>Introduction to Environmental Engineering</td>
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<tr>
<td>CE F344</td>
<td>Water Resources Engineering</td>
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<tr>
<td>CE F432</td>
<td>Steel Design</td>
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<tr>
<td>DRT F210</td>
<td>Intermediate CAD</td>
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<td>ES F100X</td>
<td>Engineering Alaska - An Introduction to Engineering</td>
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<td>ES F100L</td>
<td>Makerspace Alaska - A Laboratory Introduction to Engineering</td>
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<td>ES F201</td>
<td>Computer Techniques</td>
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<td>Mechanics</td>
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<td>ES F301</td>
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<td>ES F331</td>
<td>Mechanics of Materials</td>
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<td>ES F341</td>
<td>Fluid Mechanics</td>
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<td>ESM F450</td>
<td>Economic Analysis and Operations</td>
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<td>GE F261</td>
<td>General Geology for Engineers</td>
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<td>MATH F253X</td>
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<td>MATH F302</td>
<td>Differential Equations</td>
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<td>Fundamentals of Engineering (FE) Examination</td>
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<td>Complete the Fundamentals of Engineering (FE) examination administered by the State of Alaska.</td>
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<td>Graduate Civil Engineering Program Requirements</td>
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<td>Complete comprehensive exam</td>
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<td>Options</td>
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<td>Complete one of the following:</td>
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<td>CE F699</td>
<td>Thesis</td>
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<td>CE F698</td>
<td>Non-thesis Research/Project</td>
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<td>Concentration</td>
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<td>Complete one of the following:</td>
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<td>Environmental/Water Resources</td>
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<td>Civil Infrastructure</td>
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<td>Total Credits</td>
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<td>ENVIRONMENTAL/WATER RESOURCES</td>
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<td>Environmental/Water Resources Concentration Requirements</td>
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<td>Complete the following:</td>
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<tr>
<td>CE F438</td>
<td>Design of Engineered Systems ¹</td>
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<tr>
<td>CE F442</td>
<td>Water and Wastewater Treatment Design ²</td>
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<tr>
<td>or ENVE F643</td>
<td>Air Pollution Management</td>
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<tr>
<td>CE F661</td>
<td>Advanced Water Resources Engineering</td>
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<tr>
<td>or CE F683</td>
<td>Arctic Hydrology and Hydraulic Engineering</td>
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<tr>
<td>or CHEM F609</td>
<td>Aqueous and Environmental Geochemistry</td>
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CE F662  Open Channel and River Engineering  3
or CE F663  Groundwater Hydrology

Approved electives from the Environmental/Water Resources concentration area course list below (9 credits for thesis, 12 credits for project), or as approved by the committee  9-12

Total Credits  21-24

1  Fulfills the baccalaureate capstone requirement.
2  Fulfills the ABET requirement (for the B.S. degree) of one upper-level course in the field of environmental engineering, construction or transportation.

CIVIL INFRASTRUCTURE

Code  Title  Credits
Civil Infrastructure Concentration Requirements
Complete the following:
CE F438  Design of Engineered Systems  1  3
CE F433  Reinforced Concrete Design  2  3
CE F635  Numerical Methods for Geomechanics and Soil-Structure Interaction  3
CE F622  Foundations and Retaining Structures  3
or CE F605  Pavement Design  3

Approved electives from the Civil Infrastructure concentration area course list below (9 credits for thesis, 12 credits for project), or as approved by the committee  9-12

Total Credits  21-24

1  Fulfills the baccalaureate capstone requirement.
2  Fulfills the ABET requirement (for the B.S. degree) of one upper-level course in the field of environmental engineering, construction or transportation.
3  Students should select electives to ensure they complete at least 21 credits overall at the F600 level.

Recommended Elective Courses for Concentration Areas

ENVIRONMENTAL/WATER RESOURCES

Code  Title  Credits
BIOL F657  Environmental Microbiology  3
CE F442  Water and Wastewater Treatment Design  3
CE F401  Arctic Engineering  3
CE F445  Hydrologic Analysis and Design  3
CE F601  Engineering Research Communication  3
CE F624  Permafrost Engineering  3
CE F661  Advanced Water Resources Engineering  3
CE F662  Open Channel and River Engineering  3
CE F663  Groundwater Hydrology  3
CE F664  Sediment Transport  3
CE F665  Watershed Hydrology  3
CE F683  Arctic Hydrology and Hydraulic Engineering  3
CE F684  Arctic Utility Distribution  3

CHEM F609  Aqueous and Environmental Geochemistry  3
CHEM F631  Environmental Fate and Transport  3
CHEM F653  Environmental Toxicology  3
ENVE F641  Aquatic Chemistry  3
ENVE F642  Contaminant Hydrology  3
ENVE F643  Air Pollution Management  3
ENVE F644  Environmental Management and Permitting  3
ENVE F645  Unit Processes: Chemical and Physical  3
ENVE F646  Biological Unit Processes  3
ENVE F647  Biotechnology  3
ENVE F649  Hazardous and Toxic Waste Management  3
ENVE F651  Environmental Risk Assessment  3
ENVE F652  Introduction to Toxicology for Engineers and Scientists  3
ENVE F653  Environmental Measurements Laboratory  3
GEOS F616  Permafrost  3
GEOS F617  Glaciers  3
ME F658  Energy and the Environment  3

CIVIL INFRASTRUCTURE

Code  Title  Credits
CE F401  Arctic Engineering  3
CE F405  Design of Highways and Streets  3
CE F422  Foundation Engineering  3
CE F434  Timber Design  3
CE F451  Construction Cost Estimating and Bid Preparation  3
CE F605  Pavement Design  3
CE F607  GIS Applications in Civil Engineering  3
CE F622  Foundations and Retaining Structures  3
CE F624  Permafrost Engineering  3
CE F625  Soil Stabilization and Embankment Design  3
CE F626  Thermal Geotechnics  3
CE F627  Geotechnical Earthquake Engineering  3
CE F628  Unsaturated Soils Mechanics  3
CE F630  Advanced Structural Mechanics  3
CE F631  Advanced Structural Analysis  3
CE F633  Theory of Elastic Stability  3
CE F634  Structural Dynamics  3
CE F635  Numerical Methods for Geomechanics and Soil-Structure Interaction  3
CE F637  Earthquakes: Seismic Response of Structures  3
CE F640  Prestressed Concrete  3
CE F646  Structural Composites  3
CE F650  Bridge Engineering  3
CE F682  Ice Engineering  3
CE F683  Arctic Hydrology and Hydraulic Engineering  3
<table>
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<th>Course Code</th>
<th>Course Title</th>
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<tr>
<td>CE F684</td>
<td>Arctic Utility Distribution</td>
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<tr>
<td>CE F685</td>
<td>Topics in Frozen Ground Engineering</td>
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<td>ESM F621</td>
<td>Operations Research</td>
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<tr>
<td>GE F440</td>
<td>Slope Stability</td>
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<tr>
<td>ME F601</td>
<td>Finite Element Analysis in Engineering</td>
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<tr>
<td>ME F631</td>
<td>Advanced Mechanics of Materials</td>
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<tr>
<td>ME F642</td>
<td>Advanced Heat Transfer</td>
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<tr>
<td>ME F685</td>
<td>Arctic Heat and Mass Transfer</td>
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