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 (https://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.

Code	Title	Credits
General University Requirements		
Complete the general university requirements. (https://catalog.uaf.edu/bachelors/#gurbachelorsdegreestext)		
General Education Requirements		
Complete the general education requirements. (https://catalog.uaf.edu/bachelors/#generaleducationrequirementstext)		36-40
As part of the general education requirements, complete the following:		
CHEM F105X	General Chemistry I	
CHEM F106X	General Chemistry II	
MATH F251X	Calculus I	
B.S. Degree Requirements		
Complete the B.S. degree requirements. (https://catalog.uaf.edu/bachelors/#bachelorofsciencetext)		16
As part of the B.S. requirements, complete the following:		
MATH F252X	Calculus II	
PHYS F211X	General Physics I	
PHYS F212X	General Physics II	
Undergraduate Civil Engineering Program Requirements		
Complete the following:		
CE F112	Elementary Surveying	2-3
or MIN F202	Surveying and CAD for Engineers	
CE F302	Fundamentals of Transportation Engineering	3
CE F326	Introduction to Geotechnical Engineering and Foundations	4
CE F331	Structural Analysis	3
CE F334	Properties of Materials	3
CE F341	Introduction to Environmental Engineering	4
CE F344	Water Resources Engineering	3
CE F432	Steel Design	3
DRT F210	Intermediate CAD	3
ES F100X	Engineering Alaska - An Introduction to Engineering	3
ES F100L	Makerspace Alaska - A Laboratory Introduction to Engineering	1
ES F201	Computer Techniques	3
ES F208	Mechanics	4
ES F301	Engineering Analysis	3
ES F331	Mechanics of Materials	3
ES F341	Fluid Mechanics	4
ESM F450	Economic Analysis and Operations	3
GE F261	General Geology for Engineers	3
MATH F253X	Calculus III	4
MATH F302	Differential Equations	3
Fundamentals of Engineering (FE) Examination		
Complete the Fundamentals of Engineering (FE) examination administered by the State of Alaska.		
Graduate Civil Engineering Program Requirements		
General University Requirements		
Complete the graduate general university requirements. (https://catalog.uaf.edu/masters/#gurmastersdegreestext)		
Master's Degree Requirements		
Complete the master's degree requirements. (https://catalog.uaf.edu/masters/#typesofmastersdegrees)		
Complete comprehensive exam		
Options		
Complete one of the following:		6-9
CE F699	Thesis	
CE F698	Non-thesis Research/Project	
Concentration		
Complete one of the following:		21-24
Environmental/Water Resources		
Civil Infrastructure		
Total Credits		**144-149**

Concentrations

ENVIRONMENTAL/WATER RESOURCES

Code	Title	Credits
Environmental/Water Resources Concentration Requirements		
Complete the following:		
CE F438	Design of Engineered Systems [1]	3
CE F442	Water and Wastewater Treatment Design [2]	3
or ENVE F643	Air Pollution Management	
CE F661	Advanced Water Resources Engineering	3
or CE F683	Arctic Hydrology and Hydraulic Engineering	
or CHEM F609	Aqueous and Environmental Geochemistry	

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 [3]		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	
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 [3]		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 F655	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	1
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

CE F684	Arctic Utility Distribution	3
CE F685	Topics in Frozen Ground Engineering	3
ESM F621	Operations Research	3
GE F440	Slope Stability	3
ME F601	Finite Element Analysis in Engineering	3
ME F631	Advanced Mechanics of Materials	3
ME F642	Advanced Heat Transfer	3
ME F685	Arctic Heat and Mass Transfer	3