

# B.S., GEOLOGICAL ENGINEERING

## Program Requirements

Students must earn a C- grade or better in each course.

## Minimum Requirements for Geological Engineering B.S.: 127 credits

Code	Title	Credits
<b>General University Requirements</b>		
Complete the general university requirements. ( <a href="http://catalog.uaf.edu/bachelors/">http://catalog.uaf.edu/bachelors/</a> )		
<b>General Education Requirements</b>		
Complete the general education requirements. ( <a href="http://catalog.uaf.edu/bachelors/general-education-requirements/">http://catalog.uaf.edu/bachelors/general-education-requirements/</a> )		
As part of the general education requirements, complete:		
CHEM F105X	General Chemistry I	
CHEM F106X	General Chemistry II	
MATH F251X	Calculus I	
<b>B.S. Degree Requirements</b>		
Complete the B.S. degree requirements. ( <a href="http://catalog.uaf.edu/bachelors/summary-of-bachelors-degree-reqs/#bachelorofsciencetext">http://catalog.uaf.edu/bachelors/summary-of-bachelors-degree-reqs/#bachelorofsciencetext</a> )		
As part of the B.S. degree requirements, complete:		
MATH F252X	Calculus II	
PHYS F211X	General Physics I	
PHYS F212X	General Physics II	
<b>Geological Engineering Program Requirements</b>		
Complete the following:		
ES F208	Mechanics	4
ES F331	Mechanics of Materials	3
ES F341	Fluid Mechanics	4
ES F346	Introduction to Thermodynamics	3
GE F101	Introduction to Geological Engineering	1
GE F261	General Geology for Engineers	3
GE F326	Introduction to Geotechnical Engineering and Foundations	4
GE F375	Terrain Analysis and GIS	3
GE F381	Field Methods and Applied Design I	2
GE F382	Field Methods and Applied Design II	2
GE F405	Engineering and Environmental Geophysics	3
GE F420	Groundwater Engineering	3
GE F480	Senior Design <sup>1</sup>	3
GEOS F213	Mineralogy	4
GEOS F214	Petrology and Petrography	4
GEOS F314	Structural Geology	4
GEOS F322	Stratigraphy and Sedimentation	4
MATH F253X	Calculus III	4
MATH F302	Differential Equations	3
MIN F202	Surveying and CAD for Engineers	2-3

or CE F112	Elementary Surveying	
MIN F370	Rock Mechanics	3
MIN F390	Geostatistics and Mineral Economics	3-6
or STAT F200X and ESM F450	Elementary Statistics and Economic Analysis and Operations	

**Technical Electives <sup>2</sup>** 6

Complete 6 credits from any of the following options:

### GEOTECHNICAL/ARCTIC OPTION

GE F430	Geomechanical Instrumentation	
GE F440	Slope Stability	
GE F441	Geohazard Analysis	
GE F445	Design of Earth Dams and Embankments	
CE F422	Foundation Engineering	
CE F401	Arctic Engineering	
CE F424	Permafrost Engineering	

### GIS OPTION

GE F376	GIS Applications in Geological and Environmental Engineering	
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### MINING OPTION

GE F435	Exploration Design	
MIN F482	Computer-aided Mine Design:VULCAN	
GEOS F332	Ore Deposits and Structure	

### PETROLEUM OPTION

PETE F302	Well Logging	
PETE F407	Petroleum Production Engineering	
PETE F426	Drilling Engineering	

### WATER RESOURCES/ENVIRONMENTAL ENGINEERING OPTION

CE F341	Introduction to Environmental Engineering	
CE F344	Water Resources Engineering	
CE F442	Water and Wastewater Treatment Design	
CE F445	Hydrologic Analysis and Design	

### Fundamentals of Engineering (FE) Examination

Complete the Fundamentals of Engineering (FE) examination administered by the State of Alaska.

<sup>1</sup> Fulfills the baccalaureate capstone requirement.

<sup>2</sup> Technical elective credits must contain engineering design and be selected by the student from the list of approved technical electives from the geological engineering program in conference with the advisor and approved by the department. Students are expected to complete all prerequisites required for the selected courses.