

Geological Engineering

College of Engineering and Mines
Department of Mining and Geological Engineering
907-474-7388
www.uaf.edu/cem/ge/

B.S., M.S. Degree

Minimum Requirements for Degree: 134 credits

The mission of the geological engineering program is to advance and disseminate knowledge related to mineral and energy exploration, evaluation, development and production; engineering site selection, construction and construction material production; and groundwater and geo-environmental engineering including geologic hazards assessment, through creative teaching, research and public service with an emphasis on Alaska, the North and its diverse peoples.

Geological engineering deals with the application of geology. Geological engineers work with the environment in the true sense of the word. Properties of earth materials exploration activities, geophysical and geochemical prospecting, site investigations and engineering geology are all phases of geological engineering.

The program prepares students for employment with industry, consulting companies and government agencies.

The educational objectives of the geological engineering program are:

1. To graduate students who are competent engineers and who are prepared for employment in one of the following professional areas: mineral and energy exploration, evaluation, development, and production; geotechnical engineering; ground water engineering; or geo-environmental engineering.
2. To graduate students who are prepared to solve problems germane to Alaska, the North, and its diverse peoples.
3. To graduate students who are prepared for graduate studies at the masters or doctoral level.
4. To advance and disseminate knowledge through competent faculty: who teach and mentor students, conduct creative research relevant to the needs of Alaska and are engaged in public service to enhance the lives of the diverse peoples of the North.

For more information about the Geological Engineering Program mission, goals and educational objectives, visit www.uaf.edu/sme/ge_mission.html.

Major — B.S. Degree

1. Complete the general university requirements (page 124).
 2. Complete the B.S. degree requirements (page 129).
 3. Complete the following program (major) requirements:

CHEM F105X—General Chemistry**	4
CHEM F106X—General Chemistry**	4
ES F201—Computer Techniques	3
ES F208—Mechanics	4
ES F331—Mechanics of Materials	3
ES F341—Fluid Mechanics	4
GE F101—Introduction to Geological Engineering	1
GE F261—General Geology for Engineers	3
GE F365—Geological Materials Engineering	3
GE F375—Principles of Engineering Geology and Terrain Analysis	3
GE F381W—Field Methods and Applied Design I	2
GE F382W—Field Methods and Applied Design II	4
GE F405—Exploration Geophysics	3
GE F420—Subsurface Hydrology	3
GE F471—Remote Sensing for Engineering	3
GE F480W—Senior Design	3
GEOS F213—Mineralogy	4
GEOS F214—Petrology and Petrography	4
GEOS F322—Stratigraphy and Sedimentation	4
GEOS F332—Ore Deposits and Structure	3
MATH F200X—Calculus I**	4
MATH F201X—Calculus II**	4
MATH F202X—Calculus III**	4
MATH F302—Differential Equations	3
MIN F202—Mine Surveying	3
MIN F370—Rock Mechanics	3
MIN F408O—Mineral Valuation and Economics	3
PHYS F211X—General Physics**	4
PHYS F212X—General Physics**	4
STAT F200X—Elementary Probability and Statistics	3
Technical electives***	6
 4. Minimum credits required 134
- * Student must earn a C grade or better in each ES, GE, GEOS, MIN and technical elective courses.
- ** Satisfies core or B.S. degree requirements but not both.
- *** Technical elective credits must contain engineering design and be selected by the student from a list of approved technical electives from the geological engineering program in conference with his or her advisor and approved by the department.
- Note: Candidates for the B.S. degree in geological engineering are required to take a proficiency exam at the end of their sophomore year. They must also take a comprehensive exit exam in their general field before graduation (as well as the state of Alaska Fundamentals of Engineering examination). Fundamentals of Engineering examination is a first step toward registration as professional engineers.
- Note: Students may initiate their geological engineering program in Anchorage and transfer to Fairbanks upon completion of the freshman and sophomore years. Students intending to transfer to UAF should communicate with a faculty member of the UAF mining and geological engineering department.

Baccalaureate Core Requirements

All degrees (e.g. B.A., B.S., etc.) require additional courses.
Refer to specific degree and program requirements.

COMMUNICATION (9)

Complete the following:

ENGL F111X (3) _____
ENGL F190H may be substituted.

Complete one of the following:

ENGL F211X OR ENGL F213X (3) _____

Complete one of the following:

COMM F131X OR COMM F141X (3) _____

PERSPECTIVES ON THE HUMAN CONDITION (18)

Complete all of the following four courses:

ANTH F100X/SOC F100X (3) _____
ECON F100X OR PS F100X (3) _____
HIST F100X (3) _____
ENGL/FL F200X (3) _____

Complete one of the following three courses:

ART/MUS/THR F200X, HUM F201X OR ANS F202X (3) _____

Complete one of the following six courses:

BA F323X, COMM F300X, JUST F300X, NRM F303X,
PS F300X OR PHIL F322X (3) _____

OR complete 12 credits from the above courses PLUS

- two semester-length courses in a single Alaska Native language or other non-English language OR
- three semester-length courses (9 credits) in American Sign Language taken at the university level.

MATHEMATICS (3)

Complete one of the following:

MATH F103X, MATH F107X, MATH F161X OR
STAT F200X (3 – 4) _____
* No credit may be earned for more than one of MATH F107X or F161X.

OR complete one of the following:

MATH F200X, MATH F201X, MATH F202X,
MATH F262X OR MATH F272X (4) _____

*Or any math course having one of these as a prerequisite.

NATURAL SCIENCES (8)

Complete any two (4-credit) courses:

ATM F101X (4) _____
BIOL F100X (4) _____
BIOL F103X (4) _____
BIOL F104X (4) _____
BIOL F111X (4) _____
BIOL F112X (4) _____
BIOL F115X (4) _____
BIOL F116X (4) _____
CHEM F100X (4) _____
CHEM F103X (4) _____
CHEM F104X (4) _____
CHEM F105X (4) _____
CHEM F106X (4) _____
GEOG F205X (4) _____
GEOS F100X (4) _____
GEOS F101X (4) _____
GEOS F112X (4) _____
GEOS F120X (4) _____
GEOS F125X (4) _____
MSL F111X (4) _____
PHYS F102X (4) _____
PHYS F103X (4) _____
PHYS F104X (4) _____
PHYS F115X (4) _____
PHYS F116X (4) _____
PHYS F175X (4) _____
PHYS F211X (4) _____
PHYS F212X (4) _____
PHYS F213X (4) _____

LIBRARY AND INFORMATION RESEARCH (0 – 1)

Successful completion of library skills competency test OR
LS F100X or F101X prior to junior standing (0 – 1) _____

UPPER-DIVISION WRITING AND ORAL COMMUNICATION (0)

Complete the following:

Two writing intensive courses designated (W) (0) _____
One oral communication intensive course designated (O) (0) _____

OR two oral communication intensive courses designated (O/2), at the upper-division level (see degree and/or major requirements) (0) _____

TOTAL CREDITS REQUIRED 38 – 39