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 116).
2. Complete the B.S. degree requirements (page 121).
3. Complete the following program (major) requirements:*

CHEM 105X—General Chemistry**	4
CHEM 106X—General Chemistry**	4
ES 201—Computer Techniques	3
ES 208—Mechanics	4
ES 331—Mechanics of Materials	3
ES 341—Fluid Mechanics	4
GE 101—Introduction to Geological Engineering	1
GE 261—General Geology for Engineers	3
GE 365—Geological Materials Engineering	3
GE 375—Principles of Engineering Geology and Terrain Analysis	3
GE 381W—Field Methods and Applied Design I	2
GE 382W—Field Methods and Applied Design II	4
GE 405—Exploration Geophysics	3
GE 420—Subsurface Hydrology	3
GE 471—Remote Sensing for Engineering	3
GE 480W—Senior Design	3
GEOS 213—Mineralogy	4
GEOS 214—Petrology and Petrography	4
GEOS 322—Stratigraphy and Sedimentation	4
GEOS 332—Ore Deposits and Structure	3
MATH 200X—Calculus**	4
MATH 201X—Calculus**	4
MATH 202X—Calculus**	4
MATH 302—Differential Equations	3
MIN 202—Mine Surveying	3
MIN 370—Rock Mechanics	3
MIN 408O—Mineral Valuation and Economics	3
PHYS 211X—General Physics**	4
PHYS 212X—General Physics**	4
STAT 200X—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 111X ..... (3) _____
ENGL 190H may be substituted.

Complete one of the following:
ENGL 211X **OR** ENGL 213X ..... (3) _____

Complete one of the following:
COMM 131X **OR** COMM 141X ..... (3) _____

PERSPECTIVES ON THE HUMAN CONDITION (18)

Complete all of the following four courses:
ANTH 100X/SOC 100X ..... (3) _____
ECON 100X **OR** PS 100X ..... (3) _____
HIST 100X ..... (3) _____
ENGL/FL 200X ..... (3) _____

Complete one of the following three courses:
ART/MUS/THR 200X, HUM 201X **OR** ANS 202X ..... (3) _____

Complete one of the following six courses:
BA 323X, COMM 300X, JUST 300X, NRM 303X,
PS 300X **OR** PHIL 322X ..... (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 103X, MATH 107X, MATH 161X **OR** STAT 200X ..... (3-4) _____
** No credit may be earned for more than one of MATH 107X or 161X.*

OR complete one of the following:*
MATH 200X, MATH 201X, MATH 202X,
MATH 262X **OR** MATH 272X ..... (4) _____
**Or any math course having one of these as a prerequisite*

NATURAL SCIENCES (8)

Complete any two (4-credit) courses:
ATM 101X ..... (4) _____
BIOL 100X ..... (4) _____
BIOL 103X ..... (4) _____
BIOL 104X ..... (4) _____
BIOL 105X ..... (4) _____
BIOL 106X ..... (4) _____
BIOL 111X ..... (4) _____
BIOL 112X ..... (4) _____
CHEM 100X ..... (4) _____
CHEM 103X ..... (4) _____
CHEM 104X ..... (4) _____
CHEM 105X ..... (4) _____
CHEM 106X ..... (4) _____
GEOG 205X ..... (4) _____
GEOS 100X ..... (4) _____
GEOS 101X ..... (4) _____
GEOS 112X ..... (4) _____
GEOS 120X ..... (4) _____
GEOS 125X ..... (4) _____
MSL 111X ..... (4) _____
PHYS 102X ..... (4) _____
PHYS 103X ..... (4) _____
PHYS 104X ..... (4) _____
PHYS 115X ..... (4) _____
PHYS 116X ..... (4) _____
PHYS 175X ..... (4) _____
PHYS 211X ..... (4) _____
PHYS 212X ..... (4) _____
PHYS 213X ..... (4) _____

LIBRARY AND INFORMATION RESEARCH (0–1)
Successful completion of library skills competency test **OR**
LS 100X or 101X 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

UNIVERSITY OF ALASKA FAIRBANKS
Office of Admissions and the Registrar • P.O. Box 757480 • Fairbanks, AK 99775-7480 • admissions@uaf.edu • www.uaf.edu