Geological Engineering

School of Mineral Engineering
Department of Mining and Geological Engineering
(907) 474-7388
www.uaf.edu/sme/GeolEng.html

B.S. Degree

Minimum Requirements for Degree: 134 credits

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 undergraduate and graduate programs prepare students for employment with industry, consulting companies and government agencies.

Major—B.S. Degree

1. Complete the general university requirements (page 106).

2. Complete the B.S. degree requirements (page 112).

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 ..............................................4  
   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 332— Ore Deposits and Structure ...................................3  
   GEOS 421—Sedimentology ....................................................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 4080—Mineral Valuation and Economics ............................3  
   PHYS 211X—General Physics** .............................................4  
   PHYS 212X—General Physics** .............................................4  
   STAT 200—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.

Note: Page numbers refer to the UAF 2004-2005 academic catalog, which can be viewed online at www.uaf.edu/catalog/.
# General University Requirements

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

## COMMUNICATIONS (9)

Complete the following:

- ENGL 111X .............................................. (3) ___
- ENGL 211X OR 213X .................................. (3) ___
- COMM 131X OR 141X .................................. (3) ___

## LIBRARY & INFORMATION SKILLS (0–1)

Complete the following:

- LS 100X OR 101X ..................................... (0–1) ___

OR Successful completion of library skills competency test.

## PERSPECTIVES ON THE HUMAN CONDITION (18)

Complete either the following six courses:

- ANTH 100X OR SOC 100X ................................ (3) ___
- ECON/PS 100X .......................................... (3) ___
- HIST 100X .............................................. (3) ___
- ART/MUS/THR 200X, HUM 201X OR ANS 202X .... (3) ___
- ENGL/FL 200X ......................................... (3) ___
- PHIL 322X, NRM 303X, COMM 300X, PS 300X OR JUST 300X .......... (3) ___

OR Complete 12 cr from the above list **PLUS** two semester-length courses in a single non-English or Alaska Native language at the university level **OR** three semester-length courses (9 cr) in American Sign Language.

## MATHEMATICS (3–4)

Complete 3–4 credits from the following:

- MATH 107X ............................................. (3) ___
- OR MATH 131X (except for BBA) ............... (3) ___
- OR MATH 161X ........................................ (3) ___
- MATH 200X ............................................ (4) ___
- MATH 201X ............................................ (4) ___
- MATH 202X ............................................ (4) ___
- MATH 262X ............................................ (4) ___
- MATH 272X ............................................ (3) ___

**NOTE:** Additional 3 cr of math needed for degree requirements.

## NATURAL SCIENCES (8)

Complete 8 credits from the following:

- ATM 101X .............................................. (4) ___
- BIOL 103X OR 104X ................................. (4) ___
- BIOL 105X–106X .................................... (8) ___
- BIOL 111X–112X .................................... (8) ___
- CHEM 100X ............................................ (4) ___
- CHEM 103X–104X .................................... (8) ___
- CHEM 105X–106X .................................... (8) ___
- GEOG 205X ............................................ (4) ___
- GEOS 100X OR 120X OR 125X .................. (4) ___
- GEOS 101X–112X .................................... (8) ___
- MSL 111X .............................................. (4) ___
- PHYS 102X OR 175X ............................... (4) ___
- PHYS 103X–104X .................................... (8) ___
- PHYS 211X–212X .................................... (8) ___
- PHYS 211X–213X .................................... (8) ___
- PHYS 212X–213X .................................... (8) ___