

# Mining Engineering

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

## B.S. Degree

Minimum Requirements for Degree: 132 credits

As the nation's northernmost accredited mining engineering program, our mission is to advance and disseminate knowledge for exploration, evaluation, development and efficient production of mineral and energy resources with assurance of the health and safety of persons involved and protection of the environment, through creative teaching, research and public service with an emphasis on Alaska, the North and its diverse peoples.

The mining engineering program emphasizes engineering as it applies to the exploration and development of mineral resources and upon the economics of the business of mining. The program offers specializations in exploration, mining or mineral beneficiation.

Students are prepared for job opportunities with mining and construction companies, consulting and research firms, equipment manufacturers, investment and commodity firms in the private sector, as well as with state and federal agencies.

The mining engineering program educational objectives are:

1. To graduate competent engineers who are prepared for employment in the mineral and energy industries, prepared to solve problems germane to Alaska, and prepared for graduate studies at the masters or doctoral level.
2. To advance and disseminate knowledge through competent faculty who teach and mentor students, conduct creative research relevant to the needs of the State of Alaska, and are engaged in public service to enhance the lives of the diverse people of the North.

Mining engineers may aspire to, and achieve, the highest positions in the industry: operating or engineering management, government agency director or entrepreneur. Starting salaries are among the highest in the engineering profession.

Students may initiate their mining engineering program in Anchorage and transfer to Fairbanks upon completion of their freshman or sophomore year. Anchorage students intending to transfer to Fairbanks should contact faculty of the UAF mining engineering department.

Candidates for the B.S. degree in mining engineering must take a comprehensive examination in their general field (completion of the state of Alaska Fundamentals of Engineering examination will satisfy this requirement). The state of Alaska Fundamentals of Engineering is a first step toward registration as a professional engineer.

For more information about the Mining Engineering Program mission, goals and educational objectives, visit [www.uaf.edu/sme/min\\_mission.html](http://www.uaf.edu/sme/min_mission.html).

## Major—B.S. Degree

1. Complete the general university requirements. (See page 116. As part of the core curriculum requirements, complete: CHEM 105X, CHEM 106X, LS 101X and MATH 200X.)
2. Complete the B.S. degree requirements. (See page 121. As part of the B.S. degree requirements, complete: MATH 201X, PHYS 211X and PHYS 212X.)

3. Complete the following program (major) requirements:\*

|  |   |
|--|---|
| ES 201—Computer Techniques .....   | 3 |
| ES 208—Mechanics.....  | 4 |
| ES 307—Elements of Electrical Engineering .....                                    | 3 |
| ES 331—Mechanics of Materials.....   | 3 |
| ES 341—Fluid Mechanics .....   | 4 |
| ES 346—Basic Thermodynamics.....   | 3 |
| GE 261—General Geology for Engineers .....   | 3 |
| GEOS 262—Rocks and Minerals.....   | 3 |
| GEOS 332—Ore Deposits and Structure.....   | 3 |
| MIN 103—Introduction to Mining Engineering.....                                    | 1 |
| MIN 104—Mining Safety and Operations Lab.....                                      | 1 |
| MIN 106—Mining Operations I.....   | 1 |
| MIN 202—Mine Surveying .....   | 3 |
| MIN 206—Mining Operations II.....  | 1 |
| MIN 301—Mine Plant Design.....   | 3 |
| MIN 302—Underground Mine Environmental Engineering .....                           | 3 |
| MIN 313—Introduction to Mineral Preparation.....                                   | 3 |
| MIN 370—Rock Mechanics .....   | 3 |
| MIN 407W—Mine Reclamation and Environmental Management                             | 2 |
| MIN 408O—Mineral Valuation and Economics .....                                     | 3 |
| MIN 409—Operations Research and Computer Applications in<br>Mineral Industry ..... | 3 |
| MIN 443—Principles and Applications of Industrial Explosives ...                   | 3 |
| MIN 454—Underground Mining Methods .....   | 3 |
| MIN 482—Computer Aided Mine Design .....   | 3 |
| MIN 484—Surface Mining Methods II.....   | 2 |
| MIN 489W—Mining Design Project I.....  | 1 |
| MIN 490W—Mining Design Project II .....  | 2 |
| MIN 485—Mining Engineering Exit Exam.....  | 0 |

4. Complete the following program (major) requirements:

|                                       |   |
|---------------------------------------|---|
| MATH 202X—Calculus.....               | 4 |
| MATH 302—Differential Equations ..... | 3 |
5. Complete 3 credits\* from the following recommended technical electives:\*\*

|   |     |
|---|-----|
| GE 440—Slope Stability .....              | 3   |
| MIN 401—Mine Site Field Trip.....         | 2   |
| MIN 447—Placer Mining.....                | 3   |
| MIN 472—Ground Control .....              | 3   |
| MIN 481—Computer Aided Mine Design I..... | 3   |
| Approved technical electives.....         | 3–6 |
6. Minimum credits required.....132

\* Student must earn a C grade or better in each course.

\*\* Students must plan their elective courses in consultation with their mining engineering faculty advisor. Technical electives are selected from the list of the approved technical electives for mining engineering program and other programs course listing. All elective courses must be approved by the department head.

## 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**