

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.

Major — B.S. Degree

1. Complete the general university requirements. (See page 124. As part of the core curriculum requirements, complete: CHEM F105X, CHEM F106X, LS F101X and MATH F200X.)
 2. Complete the B.S. degree requirements. (See page 129. As part of the B.S. degree requirements, complete: MATH F201X, PHYS F211X and PHYS F212X.)
 3. Complete the following program (major) requirements:*
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|--|---|
| ES F201—Computer Techniques | 3 |
| ES F208—Mechanics | 4 |
| ES F307—Elements of Electrical Engineering | 3 |
| ES F331—Mechanics of Materials | 3 |
| ES F341—Fluid Mechanics | 4 |
| ES F346—Basic Thermodynamics | 3 |
| GE F261—General Geology for Engineers | 3 |
| GEOS F262—Rocks and Minerals | 3 |
| GEOS F332—Ore Deposits and Structure | 3 |
| MIN F103—Introduction to Mining Engineering | 1 |
| MIN F104—Mining Safety and Operations Lab | 1 |
| MIN F106—Mining Operations I | 1 |
| MIN F202—Mine Surveying | 3 |
| MIN F206—Mining Operations II | 1 |
| MIN F301—Mine Plant Design | 3 |
| MIN F302—Underground Mine Environmental Engineering .. | 3 |
| MIN F313—Introduction to Mineral Preparation | 3 |
| MIN F370—Rock Mechanics | 3 |
| MIN F407W—Mine Reclamation and Environmental Management | 2 |
| MIN F408O—Mineral Valuation and Economics | 3 |
| MIN F409—Operations Research and Computer Applications in Mineral Industry | 3 |
| MIN F443—Principles and Applications of Industrial Explosives | 3 |
| MIN F454—Underground Mining Methods | 3 |
| MIN F482—Computer Aided Mine Design | 3 |
| MIN F484—Surface Mining Methods II | 2 |
| MIN F489W—Mining Design Project I | 1 |
| MIN F490W—Mining Design Project II | 2 |
| MIN F485—Mining Engineering Exit Exam | 0 |
4. Complete the following program (major) requirements:
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|--|---|
| MATH F202X—Calculus | 4 |
| MATH F302—Differential Equations | 3 |
5. Complete 3 credits* from the following recommended technical electives:**
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|---|-------|
| GE F440—Slope Stability | 3 |
| MIN F401—Mine Site Field Trip | 2 |
| MIN F447—Placer Mining | 3 |
| MIN F472—Ground Control | 3 |
| MIN F481—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 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