Submit originals and one copy and electronic copy to Governance/Faculty Senate Office (email electronic copy to fysenat@uaf.edu)

PROGRAM/DEGREE REQUIREMENT CHANGE (MAJOR/MINOR)

SUBMITTED BY:

<table>
<thead>
<tr>
<th>Department</th>
<th>College/School</th>
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<tbody>
<tr>
<td>Mining &amp; Geological Engineering</td>
<td>CEM</td>
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<table>
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<tr>
<th>Prepared by</th>
<th>Phone</th>
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<tbody>
<tr>
<td>Gang Chen</td>
<td>6875</td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th>Email Contact</th>
<th>Faculty Contact</th>
</tr>
</thead>
<tbody>
<tr>
<td><a href="mailto:gchen@alaska.edu">gchen@alaska.edu</a></td>
<td>Gang Chen</td>
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</tbody>
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See http://www.uaf.edu/uafgov/faculty/cd for a complete description of the rules governing curriculum & course changes.

PROGRAM IDENTIFICATION:

<table>
<thead>
<tr>
<th>DEGREE PROGRAM</th>
<th>Mining Engineering</th>
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<tbody>
<tr>
<td>Degree Level: (i.e., Certificate, A.A., A.A.S., B.A., B.S., M.A., M.S., Ph.D.)</td>
<td>B.S.</td>
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A. CHANGE IN DEGREE REQUIREMENTS: (Brief statement of program/degree changes and objectives)

Eliminating MIN106, MIN206 and MIN433 from the catalog, Creating and Adding MIN225 and MIN226 to the degree requirements, Adding one credit to MIN407W, Adding CE603 and MIN415 and MIN646 to the technical elective list, Correcting MIN481 and MIN482 course titles in the program description, Removing ES201 from the degree requirements, Clarifying language on FE exam, and Modifying program objectives.

B. CURRENT REQUIREMENTS AS IT APPEARS IN THE CATALOG:

**Mining Engineering**

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

**B.S., M.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/cem/min/about/.

**Major — B.S. Degree**

1. Complete the general university requirements. (As part of the core curriculum requirements, complete: CHEM F105X, CHEM F106X, LS F101X and MATH F200X.)

2. Complete the B.S. degree requirements. (As part of the B.S. degree requirements, complete: MATH F201X, PHYS F211X and PHYS F212X.)

3. Complete the following program (major) requirements:*  
   ES F201—Computer Techniques—3 credits  
   ES F208—Mechanics—4 credits  
   ES F307—Elements of Electrical Engineering—3 credits  
   ES F331—Mechanics of Materials—3 credits  
   ES F341—Fluid Mechanics—4 credits  
   ES F346—Basic Thermodynamics—3 credits  
   GE F261—General Geology for Engineers—3 credits  
   GEOS F262—Rocks and Minerals—3 credits  
   GEOS F332—Ore Deposits and Structure—3 credits  
   MIN F103—Introduction to Mining Engineering—1 credit  
   MIN F104—Mining Safety and Operations Lab—1 credit  
   MIN F106—Mining Operations I—1 credit  
   MIN F202—Mine Surveying—3 credits  
   MIN F206—Mining Operations II—1 credit  
   MIN F301—Mine Plant Design—3 credits  
   MIN F302—Underground Mine Environmental Engineering—3 credits  
   MIN F313—Introduction to Mineral Preparation—3 credits  
   MIN F370—Rock Mechanics—3 credits  
   MIN F407W—Mine Reclamation and Environmental Management—2 credits  
   MIN F408O—Mineral Valuation and Economics—3 credits  
   MIN F409—Operations Research and Computer Applications in Mineral Industry—3 credits  
   MIN F443—Principles and Applications of Industrial Explosives—3 credits  
   MIN F454—Underground Mining Methods—3 credits  
   MIN F482—Computer Aided Mine Design—3 credits  
   MIN F484—Surface Mining Methods II—2 credits  
   MIN F489W—Mining Design Project I—1 credit
MIN F490W—Mining Design Project II—2 credits
MIN F485—Mining Engineering Exit Exam—0 credits

4. Complete the following program (major) requirements:
   MATH F202X—Calculus—4 credits
   MATH F302—Differential Equations—3 credits

5. Complete 3 credits* from the following recommended technical electives:**
   GE F440—Slope Stability—3 credits
   MIN F401—Mine Site Field Trip—2 credits
   MIN F447—Placer Mining—3 credits
   MIN F472—Ground Control—3 credits
   MIN F481—Computer Aided Mine Design I—3 credits
   Approved technical electives—3 – 6 credits

6. Minimum credits required—132 credits

C. PROPOSED REQUIREMENTS AS IT WILL APPEAR IN THE CATALOG WITH THESE CHANGES:
(Underline new wording strike-through old wording and use complete catalog format)

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

B.S., M.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:

To graduate competent engineers:

• who are prepared for employment in the mineral and energy industries in temperate
and arctic regions

• who are prepared to solve problems germane to Alaska, and

• who are prepared for graduate studies at the masters or doctoral level.

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.

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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 examination 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/cem/min/about/.

Major — B.S. Degree

1. Complete the general university requirements. (As part of the core curriculum requirements, complete: CHEM F105X, CHEM F106X, LS F101X and MATH F200X.)

2. Complete the B.S. degree requirements. (As part of the B.S. degree requirements, complete: MATH F201X, PHYS F211X and PHYS F212X.)

3. Complete the following program (major) requirements:*  
   ES F201—Computer Techniques—3 credits  
   ES F208—Mechanics—4 credits  
   ES F307—Elements of Electrical Engineering—3 credits  
   ES F331—Mechanics of Materials—3 credits  
   ES F341—Fluid Mechanics—4 credits  
   ES F346—Basic Thermodynamics—3 credits  
   GE F261—General Geology for Engineers—3 credits  
   GEOS F262—Rocks and Minerals—3 credits  
   GEOS F332—Ore Deposits and Structure—3 credits  
   MIN F103—Introduction to Mining Engineering—1 credit  
   MIN F104—Mining Safety and Operations Lab—1 credit  
   MIN F106—Mining Operations I—1 credit  
   MIN F202—Mine Surveying—3 credits  
   MIN F206—Mining Operations II—1 credit  
   MIN F225—Quantitative Methods in Mining Engineering—2 credits  
   MIN F226—Introduction to Mine Development—2 credits  
   MIN F301—Mine Plant Design—3 credits  
   MIN F302—Underground Mine Environmental Engineering—3 credits  
   MIN F313—Introduction to Mineral Preparation—3 credits  
   MIN F370—Rock Mechanics—3 credits  
   MIN F407W—Mine Reclamation and Environmental Management—2.3 credits  
   MIN F4080—Mineral Valuation and Economics—3 credits  
   MIN F409—Operations Research and Computer Applications in Mineral Industry—3 credits  
   MIN F443—Principles and Applications of Industrial Explosives—3 credits  
   MIN F454—Underground Mining Methods—3 credits  
   MIN F482—Computer Aided Mine Design—VULCAN—3 credits  
   MIN F484—Surface Mining Methods II—2 credits  
   MIN F489W—Mining Design Project I—1 credit  
   MIN F490W—Mining Design Project II—2 credits  
   MIN F485—Mining Engineering Exit Exam—0 credits
4. Complete the following program (major) requirements:
   MATH F202X—Calculus—4 credits
   MATH F302—Differential Equations—3 credits

5. Complete 3 credits* from the following recommended technical electives:**
   GE F440—Slope Stability—3 credits
   MIN F401—Mine Site Field Trip—2 credits
   MIN F447—Placer Mining—3 credits
   MIN F472—Ground Control—3 credits
   MIN F481—Computer Aided Mine Design I—TECHBASE—3 credits
   MIN F415—Coal Preparation—3 credits
   MIN F646—Mining Engineering in the Arctic—3 credits
   CE F603—Arctic Engineering—3 credits
   Approved technical electives—3 – 6 credits

6. Minimum credits required—132 credits

D. ESTIMATED IMPACT

WHAT IMPACT, IF ANY, WILL THIS HAVE ON BUDGET, FACILITIES/SPACE, FACULTY, ETC.

Should have no impact on budget, facilities/space and faculty.

E. IMPACTS ON PROGRAMS/DEPARTMENTS:

What programs/departments will be affected by this proposed action?
Include information on the Programs/Departments contacted (e.g., email, memo)

The changes are within the mining engineering program and will have no impact to other departments/programs.

F. IF MAJOR CHANGE — ASSESSMENT OF THE PROGRAM:

Description of the student learning outcomes assessment process.)

N/A

JUSTIFICATION FOR ACTION REQUESTED

The purpose of the department and campus-wide curriculum committees is to scrutinize program/degree change applications to make sure that the quality of UAF education is not lowered as a result of the proposed change. Please address this in your response. This section needs to be self-explanatory. If you drop a course, is it because the material is covered elsewhere? Use as much space as needed to fully justify the proposed change and explain what has been done to ensure that the quality of the program is not compromised as a result.

This is a relatively minor change to the program, reflecting the suggestions made by ABET (Accreditation Board for Engineering and Technology) reviewers and consistent feedback from the students. The computer knowledge has been well covered in MIN482-Computer Aided Mine Design and the content in ES201-Computer Techniques has less application in mining engineering. Therefore, we are dropping ES201-Computer Techniques. Removing MIN106 and MIN206 and merging the contents into MIN225 and MIN226 will better serve the needs of mining engineering students, which also adapts the suggestion made by an ABET reviewer to include more probability and statistics materials in the mining
engineering curriculum. Due to increased materials in mine environment management, one additional credit is added to MIN407W- Mine Reclamation and Environmental Management. The net change in credit hours is zero.

APPROVALS:

Signature, Chair, Program/Department of:  
Mining & Geological Engineering  
Date 9/9/09

Signature, Chair, College/School Curriculum Council for:  
CEM  
Date 10/7/09

Signature, Dean, College/School of:  
CEM  
Date 10/21/09

ALL SIGNATURES MUST BE OBTAINED PRIOR TO SUBMISSION TO THE GOVERNANCE OFFICE

Signature, Chair, UAF Faculty Senate Curriculum Review Committee  
Date