Department of Mining and Geological Engineering
Post-Baccalaureate Certificate
Mining Occupational Safety and Health

I. Certificate name and description: Post-Baccalaureate Certificate in Mining Occupational Safety and Health

Description: Graduates of the Post-Baccalaureate Certificate in Mining Occupational Safety and Health will be better prepared to achieve certification as mine safety professionals and can advance on to Master of Science, Master of Engineering or Master of Public Health programs. To qualify for this certificate program, applicants must have a Bachelor’s degree in engineering or related science or health field and must meet the course pre-requisites for the courses in the certificate.

Managing college and department: College of Engineering, Department of Mining and Geological Engineering

Degree program affiliation: Applicants are not required to enter another degree program and the continuation of this certificate program is not contingent on continuation of other degree programs. Students who have successfully completed this certificate may transfer all units into the Master of Science, or Master of Engineering degree programs in mining engineering or Master of Public Health.

Business plan: All of the courses proposed for this certificate program currently exist and will be on-line by fall 2006. No new resources are required to offer this certificate. We have capacity for 12 additional students in the courses proposed for this certificate. Courses in this program currently meet or slightly exceed minimum enrollment at the undergraduate and graduate levels.

II. Certificate Requirements

Description of the Curriculum: 15 units of credit beyond the Bachelors of Science in Mining Engineering or a related degree in engineering, science, or health profession.

The Mine Health and Safety certificate option will consist of three required classes:
MNE 596a Mine Ventilation 3 units
NNE 526 Mine Health and Safety I unit
CPH 553 Toxicology and Chemical Exposures 2-4 units

The elective courses are:
CPH 576A Biostatistics 3 units
MGE 527 Geomechanics 3-4 units
MNE 547 Underground Construction Geomechanics 3 units
CPH 577 Social and Behavioral Aspects of Public Health 3 units
CPH 574 Health Administration and Policy 3 units
CPH 575 Environmental and Occupational Health 3 units
CPH 573A Basic Principles of Epidemiology 3 units
Course substitutions or changes in electives are allowed with the approval of the MGE faculty member in charge of the selected track.

Integration with Current Programs: This certificate is linked to our existing MS, MEng, and joint MS-MPH programs. No new courses are needed.

Teaching Methodology: All courses in this certificate program will be offered on-line or as video courses.

Student Learning Outcomes: At the conclusion of the certificate program, students should be able to:

- Possess a deeper knowledge from a baccalaureate degree of occupational safety and health within the general areas covered by the mineral resources industry and/or geological engineering
- Have sufficient mathematical and computer background to formulate and solve practical problems in the discipline.
- Access, analyze and utilize available information from a variety of sources.
- Use competencies associated critical thinking and problem solving
- Demonstrate life-long learning skills
- Possess an awareness of engineering ethics
- Demonstrate a commitment to the advancement of the profession

III  Student Admittance/Advising/Completion — Student must have no less than a bachelor’s degree for a post-baccalaureate, a master’s degree for a Post-Master’s certificate or be currently enrolled in a graduate level program.

Prerequisites or standardized tests required: No standardized tests required

Admissions requirements: Enrollment is limited to graduates of accredited engineering bachelor’s programs and other cognate degrees (i.e., biology, chemistry, geology, industrial hygiene, physics, etc.) with a 3.0 GPA or higher. Applicants must be able to demonstrate that they have the necessary prerequisites completed for the courses in the certificate program. To be admitted to this certificate program, candidates should have two years of progressively responsible professional experience, preferably in the specific option selected for study.

Concurrent Enrollment: Concurrent enrollment is allowed but not required in other degree programs (Professional Master of Science, Master of Engineering, Master of Public Health, Master of Business Administration, etc.)

University Credit Requirement: At least twelve credits must be taken at the university

Transfer credit: 3 units may be transferred into the certificate

Student advising: MGE faculty will advise students upon entering the certificate program and at the beginning of each academic year a student is enrolled in the program.

Transfer to a Degree Program: Students in good academic standing at the conclusion of the certificate may transfer all the credits into the Masters of Engineering, or Masters of
IV. Certificate and Student Outcomes

Provide a plan and frequency for assessing the intended certificate outcomes both for students and the certificate.

The certificate program will be assessed based on student feedback and enrollment.

Students will be surveyed upon completion of the certificate program to assess the appropriateness of the material presented to the student. Students will be asked to provide feedback on the relevance of the material presented, degree of difficulty and length of the course. The students will be surveyed a second time, three years after completion of the certificate program, to determine if the material presented was still relevant to the student's professional responsibilities and provided a platform to further advance the student in their professional career.

The certificate program will be assessed based on student enrollment. It is anticipated that enrollment will initially be low and build over time. Initial enrollment is anticipated to be four to six students. As the program becomes familiar to those in the industry and additional classes are made available, the program should increase in enrollment. After five years of continuous operation, enrollment should be eight to twelve students per year. If the enrollment targets are not met or exceeded, significant changes to the certificate program should be considered, including termination.

V. Demand

Anticipated student enrollment: 4 initially; 12 maximum

Collaboration with other departments: College of Public Health

Program demand/need:

There is a large and growing need for professionally trained health and safety professionals in high risk industries. In the mining industry alone, there are about 14,400 operating mines that are inspected by the Mine Safety and Health Administration (MSHA) for compliance with occupational safety and health rules each year. Underground mines are required to be inspected at least four times a year and surface mines are to be inspected at least twice a year. The mining industry recognized the need for trained safety and health specialists and began certifying mine safety specialists through the Certified Mine Safety Professional (CMSP) exam several years ago. Although completion of the examination requires only a general knowledge of the many health and safety issues in mining, it is recognition of this specialized need. The rules governing the occupational health and safety in mines are many and varied and increasing in both complexity and scope each year. For example, in the last four years 34 new rules were enacted and coverage was extended to include all aspects of sand and gravel mining. Virtually every mining operation has an employee responsible for miner health and safety. Most large companies have several employees directly involved in miner health and safety and more progressive companies
have positions as high as vice president dedicated to safety, health and environment. Mining engineers are in great demand but those with additional training in occupational health and safety are in even greater demand. This certificate program is designed to give high quality specialized training to those responsible for mine health and safety. It is designed as a distance learning program so that mine safety and health specialists can receive the training they need anywhere in the world without having to take a leave from their particular organization and professional responsibilities.

The global mineral resources industry is facing a severe shortage of engineers. With an assumption of only 0-5% annual growth in the industry the industry is short 200% of the necessary minerals engineers; with a more realistic growth of 5-10% the industry is short 600%. The shortage is driven in part by increased consumption of raw materials in the developing nations and also by the demographics of the industry. The majority of the engineers is over the age of 50 and is expected to retire in five to ten years. Hence there is demand for continuing education and post-baccalaureate education for working professionals changing their duties within companies or those who do not have a strong enough background in a particular segment of the industry and therefore need more education.

VI. Expected Faculty and Resource Requirements

The following faculty will lead this certificate program:

1) Jeff Burgess, MD, MPH
2) John Kemny, PhD.

Additional faculty needed: The hiring of one other new faculty members is pending. It is expected that any new faculty member will participate in this certificate program. No new faculty members beyond the pending hire are required.

Present FTE students and Faculty:
- Current FTE students: 40 undergraduates; 24 graduates (MS, PhD.)
- Current FTE faculty: 5

Future FTE students and Faculty (anticipated by fall 2007):
- Future FTE students: 80 undergraduates 45 graduates (ME, MS, PhD)
- Future FTE faculty: 6

VII. Supporting letters from the college dean and department head have been submitted. Dr. Jeffrey Burgess in CoPH has approved participation in this program.