

Mining Engineering B.S.



Contact Information

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Faculty

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Supporting Faculty

Professor Hansen; Associate Professor Klasi.

Mining Engineering

The mining engineering and management program, introduced as a brand new program in 2003, is designed to better meet the needs of the mining industry. It combines the traditional mining engineering education with selected management-related concepts in order to better prepare the graduates for the modern mining industry.

Mining engineering is the application of engineering and scientific principles to the discovery, appraisal, and extraction of minerals from the Earth and Sea. Mining engineering and management takes traditional mining engineering education one step farther by including management-related education in the curriculum.

The curriculum provides the student with fundamental training in the basic sciences, engineering sciences, engineering design, geology, the humanities, and mining engineering. Principles of mine operations, mine planning, mining technology, advanced 3-D design and modeling, rock mechanics, explosives technology and computer applications receive special emphasis. Key management-related concepts are introduced at all levels of the curriculum.

Significant design experience is built into the curriculum and is enhanced by the use of sophisticated 3-D design software in many of the mining courses. In this, teamwork is stressed. The students work together in small, specialized teams during many of the laboratory exercises and to complete the final capstone design project. The students will present their final design project both orally and in written form.

The mining engineering program will come up for accreditation review by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (ABET) during their next general review in 2009.

A minor in mining engineering is not available.

Mining Engineering Program Objectives

The program in mining engineering is designed to meet the changing needs of the mining industry all over the nation and the world. The program concept is a result of discussions between the Mining Engineering Industrial advisory board and the School of Mines administration.

The objective of creating this new degree at School of Mines is to provide the modern mining industry with graduates who are technically sound in mining engineering, but who can progress quickly through supervision and into management.

The curriculum has been designed to meet accreditation requirements in mining engineering. The core mining engineering curriculum provides technical training in areas such as rock mechanics, mine ventilation, ore reserve evaluation, mine design, explosive application, mining equipment selection, mining method selection, and mine land

reclamation. The curriculum also includes a strong emphasis on management-related topics: health and safety, economics and finance, labor relations, project management, environmental management, international business, and communication skills.

Professional Development

Students in the program are encouraged to become student members of their primary professional organization-the Society for Mining, Metallurgy, and Exploration (SME). Upon graduation, they are further encouraged to continue professional membership of SME. Additionally, the students can become student members of the International Society of Explosives Engineers (ISEE). Both SME and ISEE have local chapter meetings, which the students are encouraged to attend.

During their senior year, students in the mining engineering program are encouraged to take the Fundamentals of Engineering (FE) examination. Passing the FE examination is the first step in the process of registration as a Professional Engineer (PE). The second, and final, step in the registration process is the successful completion of the Professional Engineering examination, which is normally taken at least four (4) years after graduation.

The mining engineering program participates in a cooperative education program that provides an opportunity for students to combine school work with a meaningful work experience in industry. Participating companies in the program provide jobs for students during semesters scheduled for work. A student in the cooperative program should plan on four and one half (4.5) to five (5) years to graduate.

Mining Engineering Laboratories

Laboratory facilities exist in the department for rock mechanics, ventilation, GPS Surveying and computer-aided mine design. Laboratory equipment available for student use includes: equipment for rock specimen preparation, uniaxial and triaxial rock strength testing machine, direct shear machine, computerized data acquisition

system, ventilation network model, and state of art GPS based surveying equipment.

The computer laboratory consists of a new (2007) lab sponsored by industry leader in mine design software (MAPTEK) with personal computers. Available software packages are routinely used by undergraduate and graduate students for the solution of problems in rock mechanics, geostatistics, management, mineral economics, ventilation, blasting, mapping, and mine design. State-of-the-art geoscience modeling and mine planning software is used by students for surface and underground mine design.

Mining Engineering Curriculum/Checklist

It is the student's responsibility to check with his or her advisor for any program modifications that may occur after the publication of this catalog.

Freshman Year

First Semester

CHEM 112	General Chemistry I	3
CHEM 112L	General Chemistry I Lab	1
MATH 123	Calculus I	4
Humanities or Social Sciences Elective(s)		3
GE 130	Intro to Engineering	2
ENGL 101	Composition I	3
PE	Physical Education	1
TOTAL		17

Second Semester

CHEM 114	General Chemistry II	3
MATH 125	Calculus II	4
PHYS 211	University Physics I	3
MEM 120	Introduction to Mining and Sustainable Development	2
PE	Physical Education	1
Humanities or Social Sciences Elective(s)		3
TOTAL		16

Sophomore Year

First Semester

MATH 225	Calculus III	2
PHYS 213	University Physics II	3
EM 216	Engineering Mechanics (Statics and Dynamics)	4
MEM 201	Surveying for Mineral	

	Engineers	2
MEM 203	Introduction to Mine Health and Safety	1
ENGL 279	Technical Comm I	3
ECON 201	Microeconomics	3
TOTAL		18

Second Semester

MATH 321	Differential Equations	3
GEOE 221/221L	Geology for Engineers	3
ENGL 289	Technical Comm II	3
	Humanities/Social Science Course	3
MEM 202	Materials Handling and Transportation	2
MEM 204	Surface Mining Methods and Equipment for Coal, Metal and Quarrying Operations	3
TOTAL		17

Junior Year

First Semester

MEM 301	Computer Applications in Mining	2
MEM 303	Underground Mining Methods and Equipment for Coal, Metal and Stone Operations	3
MEM 305	Mine Excavation and Explosives	3
EE 303	Circuits	3
BADM 360	Organization and Management	3
MEM 307	Mineral Exploration and Geostatistics	3
TOTAL		17

Second Semester

XXX XXX	Mineralogy and Petrology	4
MEM 302	Mineral Economics and Finance	3
MEM 304	Theoretical and Applied Rock Mechanics	4
EM 328	Applied Fluid Mechanics	3
GEOE 322/322L	Structural Geology	3
TOTAL		17

Senior Year

First Semester

HRM 417	Human Resource Management	3
MEM 401	Theoretical and Applied Ventilation Engineering	4
MEM 466	Mine Management	2
MEM XXX	Mining Technical Elective ¹	3
	Hum/SSCourse (Language)	4
TOTAL		16

Second Semester

MEM 464	Mine Design and Feasibility Study	4
	Free Elective	2
TBD	Managerial Economics and Finance	3
MET 220	Coal and Minerals Processing	3
MEM 405	Mine Permitting and Reclamation	3
BADM 407	International Business	3
TOTAL		18

136 credits required for graduation

Curriculum Notes

¹Elective chosen from a list of approved mining or business courses.