

# Mining Engineering (MINE)



## Career Profile

Mining engineers apply engineering and scientific principles to discover, appraise, and extract minerals from the earth and sea. Mining engineers may work in underground mines or in surface mines overseeing the recovery of mineral resources. A mining engineering graduate generally starts out in engineering, but progresses quickly into supervision and then into management. The School of Mines' mining engineering program prepares graduates for that progression.

For graduates of the program, there are more jobs available to graduates than there are graduates to fill them. Currently, there are fewer than 15 universities offering degrees in mining engineering in the United States. In 2003, there were only about 110 mining engineering graduates nationwide.

## Accreditation

The South Dakota School of Mines and Technology is accredited by the Higher Learning Commission of the North Central Association of Colleges and Secondary Schools, the recognized accrediting agency for the north central states.

The mining engineering program is scheduled for accreditation review in Fall 2009.

## Labs and Facilities

Mining engineering laboratory and research facilities exist for the study of mine surveying, rock mechanics, mine ventilation, mine health and safety, and for mine planning and design. Laboratory equipment available for student use includes equipment for rock specimen preparation, rock strength testing machines, triaxial apparatus, direct shear machines, computerized data acquisition systems, ventilation network models, surveying equipment, and computerized mine modeling and design equipment. Modern geoscience modeling and mine planning software is used by students for surface and underground mine design.

## Faculty

**Head:** Mr. Shashi Kanth, instructor

**Professors:** Dr. Zbigniew Hladysz and Dr. Charles Kliche

## Features and Strengths

The United States grows increasingly more dependent on mineral reserves for energy and other needs. A vibrant system of mining education is fundamental to the health of the industry. The School of Mines program helps prepares for jobs in South Dakota and across the nation. A small faculty-to-student ratio guarantees personal attention for students, something not available at many larger universities.

## Program Overview

The program's course work includes mining engineering principles, management, financial analysis, human resources, and contract negotiations. The program has been designed to satisfy accreditation requirements for both mining engineering and engineering management disciplines. By establishing the program in this way, School of Mines graduates from this program possess an uncommon management emphasis along with a mining engineering education that will set them apart from their peers. The broader educational program will enable the graduates to better serve the needs of the mining industry of today and the future.

## Outcomes

- School of Mines mining engineering graduates received salary offers that average \$65,000.
- 100 percent of 2008-09 School of Mines mining engineering graduates were placed in their field or entered a graduate program within one month of graduation.
- 75 percent of graduates gain real-life experience through internships and co-ops.
- Companies hiring mining engineering graduates include Newmont Inc., Barrick Goldstrike, Peabody Energy, Kiewit Mining, Foundation Coal, Freeport McMoran, MAPTEK, Rio Tinto Energy, LaFarge, and more.

## Student Organizations

Students at the School of Mines also have a variety of opportunities for extra-curricular activities that range from music, intramurals, and drama to ski and snowboarding, and more than 75 other clubs and professional student organizations. These are important activities for students and they are encouraged to take full advantage of out-of-classroom events. Mining engineering students are encouraged to participate in the student chapters of the Society for Mining, Metallurgy, and Exploration (SME) and the International Society of Explosive Engineers (ISEE).

The Center for Advanced Manufacturing and Production (CAMP) is designed to teach students engineering, science, and design skills, as well as the ability to work in teams. Team members design, build, market, and raise the money for their projects. All students are welcome to work on CAMP projects.

## Research

Students have the opportunity to be involved in research with professors conducting work on projects

such as equipment simulation, slope stabilization, rock blasting excavation, and precision blast timing. The mining engineering and management faculty are actively engaged in the ongoing research with the Deep Underground Science and Engineering Laboratory (DUSEL).

## Curriculum Listing

<http://catalog.sdsmt.edu>

### MINING ENGINEERING AND MANAGEMENT CURRICULUM/CHECKLIST

#### 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
<b>TOTAL</b>		<b>17</b>

##### 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
<b>TOTAL</b>		<b>16</b>

#### SOPHOMORE YEAR

##### First Semester

MATH 205	Mining and Management Math I (Calc 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 Communications I	3
ECON 201	Microeconomics	3
<b>TOTAL</b>		<b>18</b>

##### Second Semester

MATH 211	Mining and Management Math II (Diff. Eq.)	3
GEOE 221/221L	Geology for Engineers	3
ENGL 289	Technical Communications II	3
Humanities/Social Science Elective(s)		3
MEM 202	Materials Handling and Transportation	2
MEM 204	Surface Mining Methods and Unit Operations	2
<b>TOTAL</b>		<b>16</b>

#### For More Information contact:

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#### JUNIOR YEAR

##### First Semester

MEM 301	Computer Applications in Mining	2
MEM 303	Underground Mining Methods and Equipment	2
MEM 305	Introduction to Explosives Engineering	3
EE 303	Circuits (for Mining)	3
IENG 366	Engineering Management	3
MEM 307	Mineral Exploration and Geostatistics	3
ATM 404	Atmospheric Thermo. (for Mining)	2
<b>TOTAL</b>		<b>17</b>

##### Second Semester

GEOE 214L	Mineralogy for Mining Engineers	1
MEM 302	Mineral Economics and Finance	3
MEM 304	Theoretical and Applied Rock Mechanics	4
EM 328	Applied Fluid Mechanics	3
MEM 4XX	Mining Technical Elective <sup>1</sup>	1
MET 220	Mineral Processing and Resource Recovery	3
<b>TOTAL</b>		<b>15</b>

#### SENIOR YEAR

##### First Semester

GEOE 341/341L	Elementary Petrology	3
BADM 407	International Business	3
MEM 401	Theoretical and Applied Ventilation Engineering	4
MEM 466	Mine Management	2
Free Elective		2
Humanities/Social Sciences (Language)		4
<b>TOTAL</b>		<b>18</b>

##### Second Semester

MEM 464	Mine Design and Feasibility Study	4
ECON 304	Managerial Economics	3
GEOE 322/322L	Structural Geology	3
MEM 405	Mine Permitting and Reclamation	3
HRM 417	Human Resource Management	3
<b>TOTAL</b>		<b>16</b>

**136 credits required for graduation**

#### Curriculum Notes

<sup>1</sup>Elective chosen from a list of approved mining or business courses.