

Mining Engineering

Mining engineering courses provide students with the knowledge necessary to enter a variety of segments of the mining industry.

Mining engineers obtain employment in one or more of the following areas: mine engineering, operations management, extraction or processing, base metals, precious metals, industrial minerals, quarry industry, explosives industry, construction or demolition, mining equipment suppliers and mining/geotechnical consulting firms.

The mining engineering profession deals with location, extraction and use of mineral resources as well as mineral policy. Lunar and ocean mining constitute new frontiers. The mining engineer is concerned with all phases of mineral recovery, including exploration, evaluation, development, extraction, mine evaluation, reclamation, processing, and marketing of minerals.

In addition to engineering, science and liberal arts courses, appropriate courses are taken in explosives engineering, geology, mineral beneficiation, coal mine development and production, mining of metallic and aggregate minerals, mine systems design, mining economics and law, mine hygiene and safety, mine management, mine ventilation, rock mechanics, ground support and reclamation.

The mining engineer relies upon geologic knowledge and highly sensitive instruments for the location and evaluation of mineral deposits. Problems involved in the development, exploitation and the beneficiation of minerals and marketing of valuable constituents must be determined in advance.

Mining must be carried out efficiently, safely, and economically, with the welfare of the public as a primary consideration. Land must be restored to a useful condition after mining ceases and pollution controls must be designed to prevent harmful environmental effects.

Missouri S&T's ABET-accredited program combines basic science and engineering principles with a strong emphasis in design and a solid technical knowledge.

Departmental Contact Information:

573-341-4573 226 McNutt Hall
mne.mst.edu mining@mst.edu
Department Chair: Dr. Samuel Frimpong

Explosives Engineering

A minor in explosives engineering is offered. Many students studying mining, civil, petroleum, mechanical, geological or metallurgical engineering consider a minor in explosives as a way to gain expertise in this exciting specialty area. Missouri S&T's minor in explosives engineering is the only undergraduate program of its kind in the United States.

Missouri S&T operates an experimental mine near campus for explosives engineering students to safely gain hands-on experience with explosives and detonators.

Various industries use over 6 billion pounds of explosives annually in mining, tunneling, construction and other areas. Realizing the potential for jobs in explosives engineering in today's society, the goal of the program is to allow students interested in explosives engineering a chance to attain in-depth knowledge and experience in the safe use of explosives.

Student Organizations and Undergraduate Research

Undergraduate research opportunities are available through the Opportunities for Undergraduate Research program as well as many faculty-sponsored projects. An Experimental Mine, the Rock Mechanics and Explosives Research Center and industrial-scale water-jet cutting laboratories are located close to the campus and provide facilities for instruction and research.

Co-op and Internship Availability

Co-op and summer intern programs are available to students. These programs provide students with the opportunity to integrate their classroom studies with learning through productive work experiences in a field related to a student's academic or career goals.

Available Emphasis Areas

Mining engineering students may choose a specialty as part of their degree program in the following areas:

- Mining Health and Safety
- Sustainable Development
- Quarrying Engineering
- Explosives Engineering
- Coal
- Mining and the Environment

Faculty

Professors:

Samuel Frimpong², Ph.D., University of Alberta (Chair)
Paul N. Worsey³, Ph.D., University of Newcastle-Upon-Tyne
D. Stewart Gillies, Ph.D., Queensland

Associate Professors:

Jason Baird, Ph.D., Missouri S&T

Grzegorz Galecki, Ph.D., Technical University of Wroclaw
 Jerry Tien¹, Ph.D., Missouri S&T
 Maochen Ge, Ph.D. Penn State

Assistant Professors:

Kwame Awuah-Offei, Ph.D, Missouri S&T
 Nassib Aouad, Ph.D., Missouri S&T

Adjunct Faculty:

R. Karl Zipf², Ph.D., Penn State
 R. Lee Aston, J.D., Ph.D.
 Leslie Gertsch, Ph.D., Colorado School of Mines
 Gillian Worsley, Ph.D., Missouri S&T

Instructors:

Greg Shapiro, B.S., Missouri-Columbia;
 President, Steel Blasting Co., Inc.
 Matt Suttcliffe, President and CEO, Premier Pyrotechnics, Inc.

¹Registered Professional Engineer

²Registered Professional Engineer of Canada

³Chartered Engineer of United Kingdom

Scholarship Information

Freshman scholarships are awarded based on high school transcripts and ACT/SAT scores. Some may require a separate application. Scholarships ranging from \$1,000 to \$3,000 for sophomores, juniors and seniors typically require an application and are based on academic record, service activities and extracurricular activities.

Notes

Detailed information on course equivalencies, acceptable credits for elective coursework, grade requirements and prerequisites is available from S&T's Registrar's Office at registrar.mst.edu.

All Mining Engineering students are encouraged to take the Fundamentals of Engineering Examination prior to graduation. A passing grade is not required; however, this is the first step to becoming a registered professional engineer.

Bachelor of Science

Mining Engineering.....128 credit hours

Entering freshmen desiring to study Mining Engineering are admitted to the Freshman Engineering Program. They may, however, state a Mining Engineering preference, which will be used as a consideration for available freshman departmental scholarships. The focus of the Freshmen Engineering program is on enhanced advising and career counseling, with the goal of providing to the student the information necessary to make an informed decision.

FIRST YEAR

Credit

Chemistry 1310,1319,1100-General Chemistry w/ Lab.....	6
History 1200, 1300, 1310 or Pol Sci 1200.....	3
Geology 2611-Physical Mineralogy and Petrology.....	3
FE 1100-Careers in Engineering.....	1
GeoE 1150-Geology for Engineers.....	3
MechE 1720-Engineering Design.....	3
Math 1214-Calculus for Engineers I.....	4
Math 1215-Calculus for Engineers II.....	4
MinE 1912-Principles of Mining Engr.....	1
MinE 2126-Intro to Mining Safety.....	1
Physics 1135-Engineering Physics.....	4
	33

SECOND YEAR

English 1120-Exposition and Argumentation.....	3
Geo 3310-Structural Geology.....	4
MechE 2340-Statics & Dynamics.....	3
Math 2222-Calculus & Analytic Geometry III.....	4
Math 3304-Elementary Differential Equations.....	3
MinE 2925-Surveying for Mineral Engineers.....	2
MinE 3912-Materials Handling in Mines.....	3
MinE 2914-Surface Mine Design.....	3
MinE 2924-Underground Mine Design.....	3
Econ 1100 or 1200- Micro or Macroeconomics.....	3
Physics 2135-Engineering Physics II.....	4
	35

THIRD YEAR

Elective/Humanities or Social Science.....	3
Elective/Humanities or Social Science.....	3
Civile 3330-Fluid Mechanics.....	3
English 1600-Technical Writing.....	3
Stat 3113-Engineering Statistics.....	3
MinE 3913-Mining Exploration.....	3
MinE 4113-Mine Atmosphere Control.....	3
MinE 4932-Mining Methods & Equipment.....	3
MinE 4933-Surface Mining Methods & Equipment.....	3
MinE 4823-Rock Mechanics I.....	3
MinE 3412-Principles of Mineral Processing.....	3
	33

FOURTH YEAR

Elective/Humanities or Social Science.....	3
MinE Elective/Technical.....	3
MinE Elective/Technical.....	3
MinE 5612-Principals of Explosive Engr.....	3
MinE 4912-Mine Power & Drainage.....	3
MinE 4512-Mine Management.....	2
MinE 4824-Soils and Overburden Materials.....	2
MinE 4742-Environmental Aspects of Mining.....	3
MinE 4096-Mine Design Project I.....	1
MinE 4097-Mine Design Project II.....	4
	27