

West Virginia University
College of Engineering and Mineral Resources

Mining Engineering

Mining engineers deal with discovering, mapping, extracting, processing, marketing, and utilizing mineral deposits from the earth. The role of the mining engineer is often quite diversified. Mining careers offer opportunities for specialization in a large number of technical areas. The trained mining professional is well-versed in mining and geology and also in the principles of civil, electrical, and mechanical engineering as applied to the mining industry. A degree in mining engineering is designed to produce a modern professional capable of designing and managing a modern coal or mineral mining operation, or continuing into research, banking, law or consulting.

Fields of Study

- Surface Mining** - Extracting minerals and coal from the earth's surface safely and efficiently.
- Underground Mining** - Developing safe and productive mineral operations from below the ground surface.
- Blasting** - Applying engineering principles and skills to the use of explosives in the process of extracting minerals from the earth.
- Materials Handling** - Efficiently and safely moving people, equipment, and extracted minerals.
- Mine Environment** - Designing and operating ventilation systems and controlling methane, dust, lighting, and noise levels in mines to protect the miners' and public's health and safety.
- Coal and Mineral Preparation** - Processing the mined or raw minerals for use by industry, power plants, and consumers.
- Mine Design** - Designing mines to maximize output and worker safety while minimizing cost and environmental impacts.
- Geology** - Applying knowledge of the earth's structures to the discovery and extraction of useful minerals.
- Ground Control** - Laying out a mine and designing support for underground openings and surface earth structures.
- Environment** - Sustainable development principles applied to mining's temporary land impact and its restoration.
- Computer Applications** - Applying computer design and numerical modeling techniques to mining problems.
- Mine Management** - Studying management techniques to organize and operate mining and processing activities.
- Mine Surveying** - Applying science and engineering aspects of surveying in practice and developing skills and expertise in land and mine surveying.

Curriculum

The WVU Mining Engineering Curriculum begins by building a solid foundation in the technical, managerial, environmental, and social aspects of the operation of a mining enterprise. In the fourth year, the student may specialize in such career areas as coal mining; metallic ore mining; industrial mineral mining; aggregate mining; or other phases of mining engineering through the proper selection of design project and electives. A faculty advisor will guide the student in this phase of the program. Local coal fields, mines, and preparation plants provide students with extensive opportunities for research, instruction, and field-work. In the summer, students are encouraged to participate in the summer work program in coal mines or other mineral operations in WV and beyond.

Student Organizations

Besides doing their coursework, students can develop their professionalism by participating in several professional student organizations that provide contact with professional engineers as well as other engineering students. Mining engineering students are encouraged to join the WVU Student Chapter of the Society for Mining, Metallurgy, and Exploration, Inc. in which students plan several trips to meetings and mine tours each semester.

For more information, contact:

Dr. Christopher J. Bise, Chair
WVU College of Engineering and Mineral Resources
Mining Engineering Department
PO Box 6070
Morgantown, WV 26506-6070
Chris.Bise@mail.wvu.edu / (304) 293-7680 x3302

Mining Engineering Department

Undergraduate Students

- ◆ Each student receives a scholarship
- ◆ Summer employment by mining and mining-related companies is obtained with ease after attaining sophomore rank
- ◆ Student-to-student and student-to-faculty relationships are unmatched by any other department
- ◆ Active internationally recognized student chapter of the Society of Mining Engineers
- ◆ 100% employment opportunities for graduates for the last 15 years

Globally Recognized Faculty

Dr. Christopher J. Bise

Dr. Bise received his undergraduate education in mining engineering at Virginia Tech and his Ph.D. from Penn State. He chaired Penn State's mining engineering program since 1993 and created and chaired the Industrial Health and Safety program since 1996. Dr. Bise joined WVU's Department of Mining Engineering on September 1, 2006 as Chairman and C.T. Holland Distinguished Professor. He serves as academic advisor to all our undergraduate students.

Dr. Syd S. Peng

Dr. Peng is world-renowned for his ground control research and consulting. Syd is considered *the* authority on longwall mining throughout the mining industry. Thus he centers his teaching on longwall operations and on graduate ground control classes. Dr. Peng obtained his doctorate from Stanford.

Dr. A Wahab Khair

Dr. Khair for years has been the faculty advisor for the student chapter of the Society of Mining Engineers. "Doc" is commonly found around the campus with the students, assisting with projects and field trips to mining sites or companies. Dr. Khair teaches surface mining methods, mine surveying, and rock mechanics. Dr. Khair obtained his doctorate at The Pennsylvania State University.

Dr. Felicia Peng

Dr. Felicia Peng came to the Department of Mining Engineering from the Department of Mineral Processing. She currently teaches coal preparation, mineral problem solving with C++ programming, and graduate mineral processing courses. Dr. F. Peng received her doctorate from West Virginia University.

Dr. Keith A. Heasley

Dr. Heasley worked in the mining industry and government research (US Bureau of Mines/NIOSH) for over 15 years before becoming a university associate professor. For the USBM, he was a rock mechanics specialist, focusing on numerical modeling and ground control safety. Keith teaches the computer aspects of surface mining, rock mechanics and senior mine design, and graduate courses in numerical modeling. Dr. Heasley obtained his doctorate from the Colorado School of Mines. Currently, he is an associate professor in the Department of Mining Engineering.

Dr. Yi Luo

Dr. Luo studied mine ventilation with particular interest in ventilation and air conditioning in deep and hot mines for his M.S. degree from the University of Idaho. In 1989 he earned his Ph.D. for WVU, specializing in prediction and control of mine subsidence. Currently, he is an associate professor in the Department of Mining Engineering, WVU.

Four-Year Study Program for MINING ENGINEERING

FIRST YEAR

<u>First Semester</u>		<u>Hours</u>	<u>Second Semester</u>		<u>Hours</u>
Math 155	Calculus I	4	Math 156	Calculus II	4
Chem 115	Fundamentals of Chem	4	Phys 111	General Physics	4
Engr 101	Composition & Rhetoric	3	Engr 102	Freshman Engr. Des. & Anal.	3
Geol 101	Planet Earth	3	Stat 211	Elem. Statistical Inference	3
Geol 102	Planet Earth Lab	1		GEC elective	3
Engr 101	Freshman Engr. Design	2			
Engr 199	Orient. To Engineering	1			
TOTAL		18	TOTAL		17

SECOND YEAR

<u>First Semester</u>		<u>Hours</u>	<u>Second Semester</u>		<u>Hours</u>
Math 251	Multivariate. Calculus	4	Math 261	Elem. Diff. Equat.	4
Geol 342	Structural Geol. for Engrs.	3	Phys 112	General Physics	4
MAE 241	Statics	3	MAE 242	Dynamics	3
MinE 201	Mine Surveying	3	MAE 331	Fluid Mechanics	3
MinE 205	Underground Mining Syst.	3	MinE 206	Surface Mining Systems	4
MinE 261	Engineering CAD	2			
TOTAL		18	TOTAL		18

THIRD YEAR

<u>First Semester</u>		<u>Hours</u>	<u>Second Semester</u>		<u>Hours</u>
MinE 306	Exploration & Evaluation	3	MinE 427	Coal Preparation	4
MinE 461	Appl. Min. Computing Meth.	3	MinE 331	Mine Ventilation	3
MinE 382	Mine Power Systems	3	Engr 102	Composition & Rhetoric	3
MAE 320	Thermodynamics	3	MAE 243	Mechanics of Materials	3
	GEC elective	3		GEC elective	3
TOTAL		15	TOTAL		16

FOURTH YEAR

<u>First Semester</u>		<u>Hours</u>	<u>Second Semester</u>		<u>Hours</u>
MinE 411	Rock Mechanics	4	AGRN 455	Reclamation of Dist. Soils	3
MinE 471	Mine & Safety Management	3	MinE 484	Mine Design - Report	3
MinE 483	Mine Design -Mapping	2	MinE 480	Multidisciplinary Team Project	1
	Technical elective	3		GEC electives	6
	GEC elective	3		Professional elective	3
TOTAL		15	TOTAL		17

GRAND TOTAL: 134

Employment Prospects

How does 100% sound? 100% of our graduates in the past 15 years have had job offers upon graduation, and many have had more than one. And the average starting salary is one of engineering's highest, normally 10% to 15% higher than the average for all engineering degrees. Why? Because there is a shortage of engineers, and of mining engineers in particular. Look around you. Notice everything that you see, and then realize this: if you can't grow it, you must mine it! Concrete, steel, copper, fertilizer, stone, jewelry, your computer, and on and on are mined products you use. It all must be mined. 51% of America's electricity comes from mining coal. American industry depends upon mining.

Summer Employment

The mining students have always been able to find jobs in the mining industry. These jobs pay mining scale - normally about \$15/hr. Students who make use of summer employment and the mining scholarships frequently graduate debt free with no student loans to repay, and without their parents having to obtain college loans. And the summer work program has another benefit: It means graduating with *work experience*. This is a real salary-building bonus at graduation.

West Virginia University

Where **Greatness** is Learned

**MINING SCHOLARSHIP APPLICATION
DEPARTMENT OF MINING ENGINEERING
COLLEGE OF ENGINEERING AND MINERAL RESOURCES
WEST VIRGINIA UNIVERSITY**

Name: _____ Email: _____

Home Address: _____ Phone No: _____

City: _____ State: _____ Zip Code: _____

EDUCATIONAL INFORMATION:

High School Name: _____

School Address: _____

High School GPA: _____ Year Graduated: _____

SAT Total: _____ Math: _____ or ACT Composite: _____ Math: _____

Scholarships are to be used exclusively for undergraduate study and participation in the Department of Mining Engineering at West Virginia University. Once you are accepted and admitted into CEMR as a mining engineering student, your scholarship will be issued in two even increments, one per semester. All students must carry a minimum of 14 credit hours each semester and demonstrate progress toward a mining degree to receive any financial support. With acceptable academic performance (GPA of 2.75 or better) the scholarship may be continued over your academic career.

Return forms or
address questions to:

Dr. Christopher J. Bise
WVU College of Engineering and Mineral Resources
Dept. of Mining Engineering
P.O. Box 6070 / Room 365 MR Building
Morgantown, WV 26506-6070
(304) 293-7680 x3302

I HAVE READ AND UNDERSTAND THE REQUIREMENTS CITED ABOVE RELATIVE TO THIS SCHOLARSHIP.

Signature _____ Date: _____

If it can't be grown, it must be mined!