

ABET PROGRAM MISSION, EDUCATIONAL OBJECTIVES AND OUTCOMES

B.S. in Mining Engineering

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Mining Engineering Program Mission

“The Mining Engineering Programs at Missouri S&T will continue to provide superb education and training to undergraduate and graduate students in mining engineering for the mining and construction industries of Missouri, U.S. and those global mining companies with strategic interests in the U.S. To this end, Missouri S&T will maintain outstanding faculty, experimental mine facilities, intensive explosives engineering programs, waterjet research facilities, program emphases (explosives, health and safety, coal, sustainable development, mining and the environment and quarrying), teaching laboratories, strong industry and alumni networks, and a very supportive administration. The programs will provide students with total quality education and research capabilities. From its humble beginnings in 1870, Missouri S&T has continued its tradition of excellence in educating mining engineers, who make a difference in industry and society, with scientific, technological and practical knowledge, leadership skills and professional ethics.” [Source: Missouri S&T 2007-2008 Undergraduate Catalog, page 201].

ABET Program Educational Objectives

ABET Definition: Program Educational Objectives are broad statements that describe the career and professional accomplishments that the program is preparing graduates to achieve.

1. Provide graduates with a broad education with firm foundations in mathematics, basic sciences and general engineering
2. Provide graduates with a strong foundation in the core Mining Engineering areas
3. Provide graduates with problem solving skills and project design capabilities
4. Develop graduates' ability to work in teams with individual and corporate responsibilities
5. Instill in graduates a sense of creativity and enthusiasm for life-long learning
6. Develop students with effective leadership and communication skills
7. Create in students an awareness of career and professional dimensions of tomorrow's industry (e.g. cultural and gender diversity, ethics, environmental liability, public and government relations)
8. Develop hard working graduates with hands-on experience and competitive drive
9. Provide students with the knowledge of relevant technologies, as well as techniques, skills and tools for modern mining engineering practice

ABET Program Outcomes

ABET Definition: Program Outcomes are narrower statements that describe what students are expected to know and be able to do by the time of graduation. These relate to the skills, knowledge, and behaviors that students acquire in their matriculation through the program.

1. Become proficient in the basic sciences, including mathematics, statistics, physics and chemistry and their applications in solving mining engineering problems
2. Understand fundamental engineering principles in statics and dynamics, mechanics of rock structures, electrical circuits, thermodynamics, fluid mechanics and engineering design and their applications in solving mining engineering problems
3. Become knowledgeable in the humanities and social sciences, business, finance and management to become familiar with the non-technical aspects of the mining engineering profession, including environmental, socio-economic, and regulatory impacts and constraints.

4. Become proficient in core mining engineering courses (explosives engineering, materials handling, mine atmospheric control, mine economics, mine health and safety, mine management, mine planning and design, mine power and drainage, mine rescue, mine surveying, mining and the environment, rock mechanics, and surface and underground mining methods) to carry out the professional duties of an entry level mining engineer upon graduation.
5. Understand the geological and mineral processing dimensions for comprehensive mine design, extraction and mineral beneficiation processes.
6. Understand specific mine design elements (geomechanics, geometric, computer-aided, and optimization of flow processes) and to undertake mining engineering design to maximize safety, economics and production efficiency.
7. Ability to outline and conduct experiments, with relevant input data and information, analysis and interpretation to draw inferences for making decisions on maintenance, improvement, or modification of an operating system
8. Function effectively on a team by understanding team dynamics, communication, social norms and conflict management.
9. Ability to identify, formulate and solve closed and open-ended problems in science, engineering, business, humanities, social sciences, and management from verbal and/or written statements.
10. Understand engineering code of ethics and its impact on professional engineering practice, especially in mine design, mine health and safety, and quality control.
11. Develop creative abilities for effective oral and written communication of both technical and non-technical materials for presentations to peers, superiors and subordinates with proficiency.
12. Knowledge of contemporary engineering issues through general education requirements, involvement in professional societies, participation in student activities, and reading of professional journals.
13. Provide leadership in competitive environments, project teams and organizational units through student chapter organizations, mine rescue, mine design and mucking competitions, student-initiated and student-led field trips, fund raising and community involvement.
14. Create in students the desire and motivation toward a life-long learning process via the online Master of Engineering program, preparation toward professional engineering certification, opportunities for conference attendance and research exposure.
15. Knowledge of the mining engineering profession through cooperative and summer internships, field trips and practical working laboratories in the Missouri S&T Experimental Mine.
16. Knowledge and familiarity of the complex relationships among technology, government, society, investors, and the environment and their impact on tomorrow's mining industry.
17. Understand global mining issues by participating in exchange programs, internships, and in-class presentations.
18. Create in students a sense of responsibility and appreciation for the continuous well-being of the Mining Engineering Program and Missouri S&T.