

College of Engineering and Mineral Resources
Department of Mining Engineering
Undergraduate Program

Outcomes Assessment

Rubric for Subsystem Mine Design and Design Projects

| Attribute | 1-Not acceptable | 2-Below expectations | 3-Meets expectations | 4-Exceeds expectations | Score |
|---|--|--|--|---|--------------|
| Design of mine element, Analysis of performance of present mine plan, Understand interrelationship between sub-system and mine plan | | | | | |
| Design of individual mine element | major errors in individual equipment design | some errors in equipment design | equipment designed correctly | unique aspects of equipment design enhance result | |
| Understand interrelationship between sub-system and mine plan | no understanding of equipment interrelationship | minimum understanding of equipment interrelationship | clear understanding of equipment interrelationship | exploitation of equipment interrelationship to enhance result | |
| Constraints/limitations of individual equipment and flowsheet understood | constraints/ limitations not understood | not all constraints/ limitations understood | constraints/ limitations clearly understood | exploitation of constraints/ limitations to enhance result | |
| Response to questions indicates understanding of MinE principles | response to questions demonstrates lack of understanding | response to questions shows gaps in understanding | response to questions shows clear understanding | response to questions shows superior understanding | |
| Significance of conclusions understood | response to questions demonstrates lack of understanding | response to questions shows gaps in understanding | response to questions shows clear understanding | response to questions shows superior understanding | |

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|--|--|---|---|--|--|
| Apply mining, math, physics, engineering science | | | | | |
| Apply engineering science | inability to apply principles | weak application of principles | good application of principles | superior application of principles | |
| Apply mining | inability to apply principles | weak application of principles | good application of principles | superior application of principles | |
| Apply physics | inability to apply principles | weak application of principles | good application of principles | superior application of principles | |
| Apply mathematics | inability to apply principles | weak application of principles | good application of principles | superior application of principles | |
| Response to questions indicates ability to apply these principles | response to questions demonstrates lack of ability to apply these principles | response to questions shows gaps in ability to apply these principles | response to questions shows clear ability to apply these principles | response to questions shows superior ability to apply these principles | |
| Resolve complex problem into components | inability to recognize component problems | weak ability to recognize component problems | good ability to apply component problems | superior ability to recognize component problems | |
| Apply economic, physical constraints and optimization methods to obtain solution | | | | | |
| Show ability to use economics to drive solution to problem and focus on important parameters | economics not used to drive solution or to define key parameters | economics sparingly used to drive solution and to define key parameters | economics used to drive solution and to define key parameters | superior solution obtained by unique use of economics | |
| Define appropriate objective function | appropriate objective function not used | poorly-defined objective function used | correct objective function used | unique objective function used to obtain unique solution | |
| Define appropriate decision variables | inappropriate or no decision variables used | not all key decision variables used | correct decision variables used | unique decision variables used to obtain unique solution | |
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|---|---|--|---|---|--|
| Correct use of optimization techniques | correct optimization techniques not used | errors in optimization methodology | correct/reasonable optimization methodology | superior optimization strategy yields unique solution | |
| Computer usage | | | | | |
| Demonstrates use to solve problem | computer not used or used incorrectly | uses computer, but contains errors | use of computer to obtain correct/valid results | superior use of computer to obtain unique solution | |
| Demonstrated use to find information | computer not used or used incorrectly | uses computer, but contains errors | use of computer to obtain correct/valid information | superior use of computer to obtain unique solution | |
| Critical analysis of computer results | believes computer results are automatically correct | poor critical analysis of computer results | good critical analysis of computer results | superior analysis of computer results yields superior/unique solution | |
| Application of safety principles (if applicable) | not done | poorly done | done well | superior job | |
| Other economic, global, societal, and legal considerations (if applicable) | not done | poorly done | done well | superior job | |