

Course Type	Course Code	Name of Course	L	T	P	Credit
ESC	NMNE101	Mine to Mill Operations	3	0	0	3

Course Objective

To create cognizance about the various mining and milling operations and techniques to optimize the processes in the journey of ore/coal from in situ deposit to the concentrate

Learning Outcomes

The following are the learning outcomes:

- Student will learn about the various activities involved in the mine to mill operations
- The students will develop an understanding of the different methods for extraction and transportation of the ore/coal and for reduction of the run-of-mine size so that valuable minerals can be liberated.
- Student will be able to correlate the energy consumption at different operations; mineral quality with production target

Unit No.	Topics to be Covered	Lecture Hours	Learning Outcome
1	Understanding different mining process: Mining terminology, exploration, reserve estimation, introduction to mining systems, mine development, equipment, ore dilution, ore transportation in mine, ore stock in mine	8	Student will learn mining system and ore handling
2	Understanding mining methods: Surface mining methods, underground coal and metal mining methods	7	Student will learn various mining methods
3	Understanding different ore process: Comminution Concept; introduction to mineral beneficiation; size reduction; crushers and grinders; ore body and processing parameters in mine block model, cut-off grade, various mineral flow circuits. Value adding to the waste material, cost sheet for mining and milling	8	Student will learn mineral beneficiation techniques
4	Understanding interdependence of mining and ore process. Ore mining and ore processes to archive maximum revenue, relative energy and cost of breakage; impact of increased blasting/mechanical cutting on Crushing, Screening, and Grinding. Concentration process.	7	Student will learn mining and mineral interdependence and optimization of the process
5	Automation in ore process –Sensors technology to detect change in the ore property affecting the ore processing, integrated simulation systems for continuous improvements, Instrumentation schemes for quality and transportation monitoring Site studies of wide range of mine to mill applications	8	Student will learn mine to mill operations. automation and case studies
6	Safety and Environment: Introduction to occupational safety, health and environmental awareness, challenges and mine safety issues in deeper horizons	4	Students will learn the safety aspects and methods to reduce environmental pollution during mining and milling operations
Total		42	

Text Books:

1. Understanding Mine to Mill, D J McKee, ISBN: 978-1-922029-27-0; CRC press, 2013

Reference Books:

2. Surface and Underground Excavations – Methods, Techniques and Equipment (2nd ed), 2013, by R RTatiya




