

BASICS OF MINERAL ENGINEERING

Course Type	Course Code	Name of Course	L	T	P	Credits
ESC	NFME102	Basics of Mineral Engineering	3	0	0	3

Course Objective

To learn about the basics of different mineral engineering operations, in brief

Learning Outcomes

Upon successful completion of this course, students will have a brief knowledge of

- the fundamentals of mineral engineering
- the comminution and classification techniques applied in mineral engineering
- the concentration techniques used in mineral engineering
- the various dewatering techniques applied for ores and coal
- the methods of extraction

Unit No.	Topics to be Covered	Lecture Hours	Learning Outcomes
1	Introduction: Scope, objectives and applications of mineral processing; properties of rocks and coal	4	Familiarization with the basic introductory concepts of mineral engineering



	relevant to mineral processing and coal preparation.		
2	Size reduction: Definition, importance and scope of size reduction. Different types of comminution equipment used in mineral engineering.	6	Information about the fundamental different comminution principles and equipment
3	Size separation: size distribution analysis, introduction to industrial screens and classifiers	4	Information about the basics of different classification principles and equipment
4	Density separation methods: Basics of jigging, dense medium separation, spirals and Wilfley tables: their principles, application and limitations.	9	Introduction to the different density-based concentration technologies
5	Froth flotation: Theory of flotation, types of flotation, different types of flotation machines.	6	Familiarization with basics of froth flotation technology
6	Electrical and magnetic methods of concentration: Principles, basics of electrical and magnetic separators	4	Introduction to the electrical and magnetic methods of concentration
7	Dewatering: fundamentals of thickening, filtration and drying.	4	Knowledge of the fundamentals of dewatering
8	Extraction: fundamentals of pyrometallurgical, hydrometallurgical and electrometallurgical and biometallurgical methods of metal extraction. Heap leaching.	5	Knowledge of the fundamentals of metallurgical extraction processes.
Total		42	

Text Books:

S. No.	Resource/Book Name	Author(s)/Editor(s)	Publisher
1	Wills' Mineral Processing Technology	Barry A. Wills James Finch	Butterworth-Heinemann

Reference Books:

S. No.	Resource/Book Name	Author(s)/Editor(s)	Publisher
1	Principles of Mineral Dressing	Antoine Marc Gaudin	McGraw Hill