

GUJARAT TECHNOLOGICAL UNIVERSITY

B.E Semester: 3 Metallurgy Engineering

Subject Code 132103
Subject Name Mineral Processing

Sr.No	Course content
1.	Introduction and scope of mineral processing in extractive metallurgy, Mineral resources in India, Physical characteristics exploited in mineral processing, Terminology in mineral processing.
2.	Physical and chemical characteristics of industrial minerals such as Haematite, Magnetite, Galena, Chalcopyrite, Azurite, Monazite, Cassiterite, Chromite, Bauxite and Ilmenite; Economics of ore processing.
3.	Liberation and its significance, Comminution and sizing, Laws of comminution, Crushing and Grinding- types, equipment, washing, sorting and hand-picking ; Laboratory and industrial screening- equipment, screen efficiency ; Classifier- mechanical and hydraulic, sizing and sorting classifiers, Mill calculation and Selectivity index.
4.	Gravity concentration methods, Tabling, Jigging, Heavy media separation, Separation in vertical and streaming currents, Sedimentation, Dewatering techniques, Thickener, Filtration and Drying.
5.	Froth flotation : principles, reagents, collectors, modifiers and frothers, process variables in floatation, Tailings disposal, Process integration and Study of flow sheet for important minerals.
6.	Magnetic and Electrostatic separation : principles, wet and dry separators, High tension separation, Motion of solid in fluid, Stokes and Newton's law, Free and hindered settling, Thickening, Batch and continuous settling chambers.
7.	Application of computer in mineral processing.

Term Work: Experiments and Problems based on above syllabus.

Reference Books:

- 1) Principles of Mineral Dressing, A. M. Gaudin, Tata McGraw Hill.
- 2) Mineral Processing Technology, B. A. Wills, Pergamon Press.
- 3) Introduction to Mineral Processing, E. G. Kelly and D. J. Spottiswood, John Wiley & Sons.
- 4) Extraction Metallurgy, J. D. Gilchrist, Pergamon Press.
- 5) Extractive Metallurgy, Joseph Newton, Wiley Eastern.
- 6) Mineral Processing, E. J. Pryor, Pergamon Press.
- 7) Extraction of Non-ferrous Metals, H. S. Ray and K. P. Abraham, Affiliated East West Press.
- 8) Experiments in Mineral Processing, S. Venkatachalam.
- 9) Chemical Engineering, J. M. Coulron and J. F. Richardron, McGraw Hill.