

GUJARAT TECHNOLOGICAL UNIVERSITY
B. E. SEMESTER: VIII
MINING ENGINEERING

Subject Name: **GEOLOGICAL EXPLORATION OF MINERAL DEPOSITS**

Sr. No	Course Content	Total Hrs.
1.	Exploration: Basic aim of exploration. Classification of methods of exploration. Surface Exploration and sub surface exploration.	6
2.	Aerial photography and remote sensing. Geometrical characteristics. Vertical and oblique photographs. Elements and principles of stereoscopic pairs. Satellite imageries and their interpretation. Gray, coloured and infra-red photographs. Interpretative characteristics of Aerial photographs and their application in identification of Geo-morphology, Structures and Lithology.	12
3.	Principles of Geological exploratory mapping. Significance of various scales of mapping. Underground mapping.	4
4.	Geophysical exploration: Principles of geophysical exploration, Gravity methods, Application of gravity methods to mineral exploration, surface and airborne surveys, Specific application of gravity methods : to mineral and oil exploration, Magnetic methods : Magnetic methods of geophysical exploration, organization of magnetic surveys, Regional and local surveys. Precautions in magnetic surveys, Electrical methods, Potential methods, Interpretation of potential survey data. Resistivity surveying, instruments and organization, Two layer cases and interpretation of resistivity data, Seismic methods : Instruments and organization of reflection and refraction surveys, Interpretation of seismic data; application to oil exploration.	10
5.	Geochemical exploration : Principles and methods of geochemical prospecting, methods of geochemical exploration, applicability and precautions in geochemical explorations. Pedo-, Litho-, Litho-, Geo- and hydro-geochemical explorations.	6

6.	Boring : Principles of boring; Selection of sites for boreholes; surface layout; method of percussive (solid hollow and ropes), rotary,(diamond, chilled shot, clays and other system), details of equipments, properties of drilling muds, core recovery wire line, core barrel: Interpretation of borehole data, borehole logging, maintenance of records, difficult boring, controlled directional drilling, deflection of boreholes, Difficulties in boring, Fishing tools and their uses.	10
7.	Ore-guides and controls ; Ore shoo's target rings and intersecting loci, Regional and local guides to ore, Physiographic guides, Lithological and stratigraphic guides, Structural guides and fracture pattern. Mineralogical, guides, bottoming and zoning of mineral deposits.	8

Text Books/ Reference Books: