

PRPC2002 GEOLOGY OF PETROLEUM (3-0-0)

Course Objectives: To impart basic knowledge of minerals, rocks, principles of stratigraphy, structural geology and topographic maps.

Module I: (10hrs)

Minerals: General properties, Classification of minerals and properties of common rock forming minerals.

Petrology: Rocks; Classification and description of some common rocks.

Module II: (10hrs)

Stratigraphy: Principles of Stratigraphy, Concepts of palaeontology, Fossils, their mode of preservation and significance as indices of age and climate, Concept of index fossils, Broad stratigraphic subdivisions and associated rock types of important coal belts and oil fields of India.

Module III: (10hrs)

Structural Geology: Interpretation of topographic maps; Attitude of planar and linear structures; Effects of topography on outcrops. Unconformities, folds, faults and joints - their nomenclature, classification and recognition.

Module IV: (07hrs)

Forms of igneous intrusions - dyke, sill and batholiths. Effects of folds and fractures on strata and their importance in exploration activities.

Module V: (08hrs)

Exploration: Meaning, methods of exploration, surface geological methods-gravity methods, magnetic methods, geophysical methods-electrical resistivity methods, seismic refraction methods, radiometric surveying.

Course Outcomes (COs)

Upon successful completion of this course, students will be able to:

- CO1 Identify and classify common rock-forming minerals and rocks based on their general properties and characteristics. (Bloom's Level 1: Remembering)
- CO2 Explain the principles of stratigraphy, the concept of index fossils, and their significance in understanding age, climate, and stratigraphic subdivisions in India's coal belts and oil fields. (Bloom's Level 2: Understanding)
- CO3 Interpret topographic maps and analyze structural geological features such as unconformities, folds, faults, and joints to understand their classification and impact on strata. (Bloom's Level 3: Applying)
- CO4 Analyze the forms and effects of igneous intrusions, including dykes, sills, and batholiths, and evaluate their influence on structural formations and exploration activities. (Bloom's Level 4: Analyzing)
- CO5 Evaluate various methods of petroleum exploration, including surface geological techniques, geophysical methods, and seismic surveying, for their applicability and effectiveness. (Bloom's Level 5: Evaluating)
- CO6 Assess the impact of geological structures and rock formations on petroleum exploration activities through the integration of stratigraphic and structural geological concepts. (Bloom's Level 5: Evaluating)

Books:

- H.H.Rutely, 'Elements of Mineralogy', McGraw Hill Book Co., 2005.
- H.H.Read, 'Rutley's Elements of Mineralogy'.
- M.S.Krishnan, 'Geology of India'.
- P.K.Mukherjee, 'Introduction to Geology'.
- M.P.Billings, 'Structural Geology'.
- Philip Kearey, Michael Brooks, 'An Introduction to Geophysical Exploration', Blackwell Science.