

GEOTECTONICS AND STRUCTURAL GEOLOGY

UNIT 1 Geotectonics:

Study of seismic waves – structure and composition of the earth – Radioactivity – radiometric dating. Volcanism – Volcanic zones of the earth. Major tectonic features of the earth-shield areas, mobile, zones, rift Valleys, mid oceanic ridges, continental shelves and slopes, submarine Canons.

UNIT 2

Geosynclines, Isostasy, Island arcs, deep Sea trenches, continental drift, plate tectonics and sea floor spreading. Orogeny and orogenic cycles – Epeirogeny and evolution of plateaus. Structural and tectonic features of India. Quaternary tectonics

UNIT 3 Structural geology:

mechanical principles – three stages of rock deformation – elastic, plastic and rupture. Concept of stress, strain and the resulting ellipsoids. Mechanics of plastic and ruptural deformation. Factors controlling behavior of rock material. Folds – Brief resume of terminology, Classification and description – Recognition, mechanics and causes of folding – Recognition of top and bottom of beds.

UNIT 4:

Faults – Description, classification , recognition criteria and mechanics of faulting. Joints in Quantitative and qualitative classification of joints. Modes of representation of joints – Histograms, Rose diagrams and preparation of stereo grams. Unconformities – types, recognition, significance, distinction from faults and their use in dating structural events.

UNIT 5:

Cleavage, Schistosity and Lineation – their description, origin and relation to major structures. Petrofabric analysis – Field and laboratory techniques – petrofabric diagrams and their interpretation. Classification and characteristics of Tectonites, Diapirs and related structural features. Writing of field Geological report.

TEXT BOOKS

1. Billing, M.P. (1974) – Structural Geology, Prentice Hall
2. Hobbs, R.F.et.al.1976 – An outline of structural geology, Wiley
3. Hills, E.L.1965 – Elements of Structural Geology, Asia Publication House.

- | | |
|-------------------------|--|
| 4. Belousov, v.V. 1954 | – Basic problems in Geotectonics, McGraw Hill. |
| 5. De Sotter. :/U. 1956 | – Structural geology, McGraw Hill |
| 6. Navin, C.M. 1953 | – Principles of Structural Geology, wiley. |
| 7. Lahee, H. 1959 | – Field Geology, McGraw Hill. |

REFERENCE BOOKS

- | | |
|-------------------------|---|
| 1. Ragan, D.M. – 1973 | – Structural Geology, Wiley |
| 2. Ramsay, J.G. 1967 | – Folding and fracturing of Rocks. McGraw Hill |
| 3. Philips, F.C.1954 | – The use of Stereographic projection in
Structural Geology, Arnold Publishers |
| 4. Compton, R.R. – 1962 | – Manual of field geology, Wiley |
| 5. Allan Cox 1973 | - Plate tectonics, Freeman &co. |