

GEOLOGY FOR ENVIRONMENTAL ENGINEERS

MODULE-I

Physical Geology: Branches of Geology, Earth- its origin, internal constitution, and age; Atmosphere, hydrosphere, lithosphere and their constituents; Structural features such as folds, faults, unconformities.; Processes of weathering, Earthquakes, volcanoes; Geological work of river, wind, Overview of toposheets and geological maps and contouring.

MODULE-II

Mineralogy: Minerals: its properties, Properties of common rock forming minerals. Crystals and crystal systems. Classification of minerals and study of common silicate minerals (Quartz, Feldspar, Pyroxene, Mica), sulphide (Pyrite, Chalcopyrite, Galena, Sphalerite) and Oxides (Haematite, Magnetite, Chromite, Pyrolusite, Psilomelane).

Hydrology: Aquifers-types; Porosity and Permeability; Delineation of watershed and its characteristics; Calculation of Total Annual

Replenish able Recharge value; Overview of Pumping Test studies.

MODULE-III

Petrology: Igneous rocks ; Classification of rocks; Magma- its composition and constitution; Classification of igneous rocks; Description of some common igneous rocks (Peridotite, Dolerite, Basalt, Granite, Rhyolite).

Sedimentary rocks: Sedimentation process; Classification and Sedimentary rocks; Description of some common sedimentary rocks (Conglomerate, Sandstone, Shale, Limestone).

Metamorphic rocks: Processes of metamorphism;; Description of some common metamorphic rocks (State, Schist, Gneiss, Quartzite, Marble).

MODULE-IV

Economic Geology: Ore and gangue minerals; Mode of occurrence, distribution and uses of some important minerals.

Coal Geology: Coal- its composition and origin; Distribution of Indian coals.

Stratigraphy: Geological time scale; Various stratigraphic units of India.

Paleontology: Fossils- their mode of preservation and uses.

Books and References :

1. Environmental Geology-DR Coates, John Wiley & Sons, NY 1981
2. The State of India's Environment : A Citizen Report -Anil Agarwal, Vol 1&2., 1985
3. Textbook of Soil Science - Biswas and Mukherjee, TMH, New Delhi, 1994.
4. Reclaimed Land, Erosion Control, Soils and Ecology - Martin J Haigh (ed), A Balkema, 2000.
5. Environmental Geology- Indian Context -KS Valdiya.,Tata McGraw Hill, New Delhi, 1987