

B.Sc. (CBCS) Geology - I Year
Semester - I : Theory Paper - I
Physical Geology and Crystallography

(4 hrs/week)

Credits-4
(60 hours)

Credit-1- Physical Geology - Earth

Definition of Geology – Basic assumptions of Geology – Its relationship with other sciences – Branches of Geology – Aim and Applications of Geology.

Earth: Its shape, size, and density – movement and their effects. Origin and age of Earth. Interior of the earth. Geological processes – exogenic and endogenic. Definition of weathering – Types of weathering of rocks – physical and chemical; Definition of erosion and denudation, agents of erosion, cycle of erosion; erosion, transportation and deposition;

Earth movements: Definition of diastrophism, epirogeny and orogeny – Mountains. Continental drift and plate tectonics.

Wind: Development of characteristic features by wind (arid cycle) erosion and deposition – pedestal rock-mushroom topography Inselberg – Ventifacts – locus – sand dunes.

Credit-2- Glaciers-Groundwater-Sea

Glaciers: Definition of a glacier – types of glaciers – development of typical land forms by glacial erosion and deposition – Cirque, U-shaped valley, Hanging valley, Monadnocks. Moraines, Drumlin, Eskers and Varves, Characteristic features of glaciated regions.

Groundwater: Storage, of ground water – porosity, permeability aquifer, water table, zone of saturation, artesian well, spring, geysers. Development of typical land form by erosion and deposition by groundwater (Karst topography) sinkhole, cavern, stalactites and stalagmites.

Seas: offshore profile – land forms of sea – marine deposits and coral reefs. Lacustrine (Lake) deposits.

Credit-3-Rivers-Earthquakes-Volcanoes

Rivers: Erosion, Transportation and deposition of river (fluvial) cycle in different stages – Development of typical land forms by river erosion and deposition. V-shaped valley. Waterfall, alluvial fans, Natural levees, Meander, Ox-bow lakes, flood plains, Peneplain and Deltas. Types of rivers.

Earthquakes: Causes and kinds of earthquake waves, and mode of propagation, intensity of earthquakes, Richters scale – seismograph and seismogram. Effects of earthquakes.

Volcanoes: Origin, products of Volcanoes.

Credit-4-Crystallography

Definition of a crystal – amorphous and crystalline states, Morphology of Crystals – face, edge, solid angle, interfacial angle.

Forms: Simple, combination, closed, and open forms.

Symmetry: Plane, axis, centre, crystallographic axes, Parameters, indices; crystallographic notation – parameter system of Weiss, index system of Miller.

Classification of Crystals into 7 Systems.

Morphological study of the following classes of symmetry.

- I. Cubic system – Normal class -Galena type
- II. Tetragonal system – Normal class -Zircon type
- III. Hexagonal system – Normal class - Beryl type
- IV. Trigonal system- Normal class - Calcite type
- V. Orthorhombic system – Normal class - Barytes type
- VI. Monoclinic system – Normal class - Gypsum type
- VII. Triclinic system – Normal class - Axinite type

Practicals:**Credit-5 – Crystallography-Geomorphology****45 hrs (Credits:1)
(3 hrs/week)**

1. Study of Symmetry Elements of Seven Crystal Systems – Orientation and description of crystals from different crystal systems
2. Study of important geomorphological models and charts

Text Books:

1. Holmes Principles of Physical Geology by D.L.Holmes (1978).
2. Physical Geology by A.N.Stracher (1981).
3. An introduction to Crystallography - R.C.Phillips.
4. Essential of Crystallography - E.Flint.
5. A text book of Mineralogy E.S.Dana and W.E.Ford.
6. Elements of Crystallography - F.A..Wade & R.B.Mattox.
7. Elements of Mineralogy - Rutlelys.

References:

1. Basic Physical Geology by E.S.Robinson (1982).
2. The evolving Earth: A text in Physical Geology by E.S.Sawkins et al., (1978).
3. Physical Geology by B.F.Mallory and D.N.Gargo (1979).

