

ACHARYA NAGARJUNA UNIVERSITY :: NAGARJUNANAGAR-522 510

CBCS -B. Sc. GEOLOGY Syllabus

With effective from 2015-16

SEMESTER-I

Paper- I - Physical Geology&Crystallography

Unit -I

General aspects. Definition of geology - Basic assumptions of Geology - Its relationship with other sciences - Branches of geology - Aim and applications of geology. Earth as a planet: its shape, size, and density - movement and then effects. Origin and age of the earth.

Geological process - exogenic and endogenic. Definition of weathering- types of weathering of rocks- Physical and chemical; Definition of erosion and denudation, cycle of erosion; erosion, transportation and deposition; agents of erosion.

(12 hrs)

Unit-II

Rivers: Erosion, transportation and deposition of river (fluvial) cycle in different stages - Development of typical land forms by river erosion and deposition. V or V-Shaped valley. U-shaped valley. Waterfall alluvial form, meander, ox-bow lake-flood plane, natural plane, peneplain and deltas. Types of rivers.

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.

Glaciers: Definition of a glacier - types of glaciers - development of typical land forms by glacial erosion and deposition – cirque, hanging valley, Rocks-monadnocks. Morains, drum-line, kames, eskers and varves. Characteristic features of glaciated regions

(12 hrs)

Unit-III

Seas: offshore profile - land forms of sea - marine deposits and coral reefs. Lacustrine deposits.

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

Earthquakes: Cause, kinds of earthquake waves, and mode of propagation, intensity of earthquakes, Richters scale - seismograph and seismogram. Effects of earthquakes, earthquake zones - Interior of the earth based on seismic theory -

Volcanoes: origin, products of Volcanoes.

Introduction of concepts of Continental Drift & Plate tectonics: (12hrs)

Unit-IV

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, center. Crystallographic axes. Parameters, indices; crystallographic notation - parameter system of Weiss, index system of Miller. Classification of crystals into systems.

Morphological study of the following classes of symmetry

- I. Cubic system – Galena type
- II. Tetragonal system - Zircon type

(12 hrs)

Unit-V

Morphological study of the following classes of symmetry

- III. Hexagonal system - Beryl type
- IV. Trigonal system - Calcite type.
- V. Orthorhombic system - Barites type
- VI. Monoclinic system - Gypsum type -
- VII. Triclinic system - Axinite type

Twinning: Definition of twinning, Laws of twinning and Types of twinning

Text books:

1. Holmes Principles of Physical Geology- D.L. Holmes
2. Physical Geology - A.N. Stracher
3. A book of Physical Geology - A K Datta
4. An Introduction to Crystallography - R.C. Phillips
5. Essential of Crystallography- E. Flint.

References:

1. Basic Physical Geology- E.S. Robinsion
2. The evolving Earth: A text in Physical Geology - E.S. Sawkins. et al.
3. Physical Geology- B.F. Mallory and D.N. Gargo
4. A textbook of mineralogy - E.S. Dana and W.E. Ford

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LAB-I (Practicals) 100 Marks

At the end of First semester

Practical-I- Physical Geology & Crystallography

Identification of geomorphological features of Geomorphological Models.

Study of symmetry, and form of the Normal classes of seven crystal systems of the following:

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