



Semester – I

BRANCH	Subject Title	Subject Code
B.Sc. (Geology – MAJOR)	PHYSICAL GEOLOGY	GEM1

Course Learning Outcome (CLO)

1. Students will acquire a solid base of knowledge of the earth as a whole, and as well as the earth as a dynamic system, geomorphic processes and about landforms produced.
2. They will know the geologic time scale and be able to place important geologic events in the temporal framework. They will also be introduced to major structures of the Earth's crust rocks.

CONTENT

Unit - 1

Introduction to Geology:

1. Introduction to Geology, its branches and importance.
2. Introduction to Solar System; Star, planet, satellite, asteroid and meteorite.
3. Origin of the Earth- Planetesimal hypothesis.
4. Interiors of the earth- crust, mantle and core.
5. Radioactivity methods of age of the Earth. Geological Time Scale.

Unit - 2

Dynamic Earth:

1. Concept and theories of Isostasy.
2. Continental drift and Sea floor spreading and evidences.
3. Concept of plate tectonics, tectonic plates and types, and plate boundaries.
4. Mid-oceanic ridges, trenches and island arcs.

Unit - 3

Geomorphic Processes:

1. Earthquakes- causes, effects and distribution. Seismic Zones of India.



2. Volcanoes: types and landforms. Volcanic zones of the world.
3. Fundamental concepts of geomorphology.
4. Types of rock weathering.
5. Soil formation, soil profile and types of soil.

Unit - 4

Geological Works:

1. Geological works of river, and its landforms.
2. Drainage system. Introduction to wetlands.
3. Geological works of groundwater, and karsts. topography.
4. Geological works of wind and its landforms. Introduction to desert.

Unit - 5

1. Geological works:

- 1.1. Geological works of glacier, and its landforms.
- 1.2. Geological works of ocean and costal landforms.

2. Introduction to Structures:

- 2.1. Unconformity: Definition and types. Overlap and Offlap.
- 2.2. Brief introduction to fold, fault and joint.

Practical's

1. Study of Geomorphic features from models, maps and photographs.
 2. Numbering of topographic maps (Survey of India Toposheet) on various scales.
 3. Interpretation of various geomorphic landforms and drainage patterns on topographic maps.
 4. Plotting of major mountain ranges, lakes and rivers on the outline map of India.
 5. Plotting of seismic observatories on the outline map of India.
- Plotting of epicentres and magnitudes of major earthquakes of India.



Semester – II

BRANCH	Subject Title	Subject Code
B.Sc. (Geology – MAJOR)	CRYSTAL AND MINERAL SCIENCE	

Course learning outcomes:

- Students will be able to acquire a base of knowledge of the minerals as earth constituting material.
- Also, they will obtain knowledge of crystals and types. Identification of minerals and basic knowledge of rock types.

CONTENT

Unit - 1

Introduction to Crystallography:

1. Definition of mineral and crystal; rock forming and ore minerals.
2. Crystal structure: unit cell, Bravais Lattices.
3. Elements of crystal. Forms of crystal.
4. Crystallographic axes and axial angles.
5. Weiss's Parameters and Miller's Indices systems of crystal notations.

Unit - 2

Crystallography:

1. Laws of Crystallography. Interfacial angle and its measurement.
2. Crystal symmetry; plane of symmetry, axis of symmetry, centre of symmetry.
3. Classification of crystals into systems and classes.
4. Symmetry and forms of normal classes.
5. Twinning in crystals.

Unit -3

Minerals:



1. Silicate structures and classification.
2. Bonding in Minerals.
3. Isomorphism and solid solution, polymorphism & pseudomorphism.
4. Physical properties of minerals.

Unit - 4

Optical Mineralogy:

1. Refractive index, critical angle and total internal reflection.
2. Double refraction. Construction and working of Nicol prism, and introduction to polaroids.
3. Polarizing microscope- its parts and workings.
4. Optical properties of minerals.

Unit - 5

Minerals and Lithosphere:

1. Study of composition, classification, physical and optical properties the following mineral groups
 - 1.1 Granet and mica
 - 1.2. Pyroxenes and Amphiboles, and
 - 1.3. Feldspars and ilica.
2. Introduction to composition of lithosphere.
3. General characteristics of igneous, metamorphic and sedimentary rock.

Practical's

1. Study of symmetry elements of crystal (models) of normal classes.
2. Study of fundamental forms of crystal (models) of normal classes.
3. Verification of Euler's theorem.
4. Study of physical properties of minerals.
5. Study of the optical properties of important rock forming minerals using polarizing microscope.