

GEOL01GE1: Essentials of Geology

Credits - 6: (Theory- 04, Practical- 02)

Theory

Credit : 4

Contact Hours per Week : 4

Unit 1

Introduction to geology: scope, sub-disciplines and relationship with other branches of sciences.

Unit 2

Earth in the solar system, origin. Earth's size, shape, mass, density, rotational and evolutionary parameters. Solar System- Introduction to various planets - Terrestrial Planets, Jovian Planets.

Unit 3: Solid Earth, Hydrosphere, Atmosphere and Biosphere

Mechanical layering of the Earth: lithosphere, asthenosphere, mantle and core.

Earthquake and earthquake belts: seismic waves and internal constitution of the Earth.

Volcanoes and volcanism, distribution of volcanoes.

Concept of isostasy.

Formation of core, mantle, crust, atmosphere, hydrosphere and biosphere.

Convection in Earth's core and production of its magnetic field.

Geothermal gradient and internal heat of the Earth.

Unit: 4 Rocks, Mineral and fossils

Definition. General character. Usefulness.

Unit 5: Plate Tectonics

Fundamental Earth process: plate tectonics.

Plates and plate boundaries.

Origin of oceans, continents, mountains and rift valleys.

Unit 6: Earth's Surface Processes

Weathering and Erosion.

Landforms in deserts, glaciated region and river valleys.

Unit 7

Age of the earth; radioactivity and its application in determining the age of the Earth

Practical

Credit : 2

Contact Hours per Week : 4

Study of topographic sheets and description of physiographic features of an area.

Study of geological maps with simple outcrop patterns.

Study of distribution of major lithostratigraphic units on the map of India.

Suggested Reference Books:

- Holmes' Principles of Physical Geology. (1992). Chapman and Hall.
- Emiliani, C, (1992). Planet Earth, Cosmology, Geology and the Evolution of Life and Environment. Cambridge University Press.
- Gross, M.G. (1977). Oceanography: A view of the Earth. Prentice Hall.