

Core II

Historical Geology

(DYNAMIC EARTH, ITS ROCK AND FOSSIL RECORDS)

Course Objectives:

- To introduce crustal processes which shape the Earth's surface
- To explain the theory of plate tectonics and its evidences
- To provide the basis of Geologic time scale
- To introduce fossils and its use to establish evolution of life through geological time.

Learning Outcome:

- Analyze landforms and the causative crustal processes
- Understand the role of plate tectonics in shaping Earth's surface and its various landforms
- Appreciate the evolution of life through geological time through stratigraphy and its correlation
- Explain evolution of vertebrate and origin from fossil records

Unit - I: Crustal Processes & Landforms

Diastrophism – Epeirogeny and orogeny; Isostasy – concept and theories; Geosynclines, Origin of oceans, continents, mountains and rift valleys.

Unit - II: Plate Tectonics

Plate tectonics–concept and types of plate margins; Continental drift–evidences and causes; Sea-floor spreading; Mid-oceanic ridge, trenches, transform faults; Island arc.

Unit - III: Geological Time Scale and Rock records

Geological Time Scale, Principles of Stratigraphy, Stratigraphic units; Stratigraphic correlation, and Indian equivalences; Geomorphic and tectonic divisions of India.

Unit - IV: Fossils and Evolution of Life on Earth

Fossils, types and fossilization; Geological significance of fossils. Origin of life and evolution – ancient and modern concepts, evidences, theories and types, Types of fossil specimens.

Suggested Practical:

- Identification of Landforms from Tectonic Maps
 - Ring of Fire
 - Different types of plate boundaries
 - Triple junctions
- Identification of Vertebrate Fossils
- Identification of Invertebrate fossils
- Identification of Plant fossils

Text Book:

✓ *Wicander, Monroe (2012) Historical Geology, Cenage Learning.*

Suggested Readings:

- Shah, S. K. (2018), Historical Geology of India, Scientific Publishers.
- Poort & Carlson (2005) Historical Geology: Interpretations and Applications, Pearson Prentice Hall