

Core X

Sedimentary Petrology

Course Objectives:

- To introduce the concepts and principles of sedimentary processes and products
- To observe sedimentary rocks and their properties in hand specimen and under the petrographic microscope
- To introduce the different sedimentary environment, facies and their association
- To provide an overview of the different mechanisms of basin formation and provenance analysis

Learning Outcomes:

- Evaluate and identify various sedimentary rocks
- Analyze the sedimentary textures and deduce the depositional environment
- Determine the direction of younging in a succession by observing sedimentary structures.

Unit I: Sedimentary Processes

Weathering & Erosion. Fluid flow and Sediment transport. Deposition and lithification. Diagenesis and its type. Depositional Environments (Continental, Transitional and Marine).

Unit II: Texture, Fabric and Structures

Texture (grain size and shape) and its significance. Grain fabric and its interpretation, Sedimentary structures and determination of paleocurrent and direction of younging.

Unit III: Classification & Petrography

Clastic and Carbonate classification. Petrographic notes on sandstones, conglomerate, shale, limestone and breccia and their occurrences in India. Dolomite and dolomitisation.

Unit IV: Sedimentary Basins & Provenance Analysis

Sedimentary Basins and types, Sedimentary Provenance and provenance Analysis, Heavy mineral and their significance, Sedimentary Basins of India.

Practical:

- Megascopic and Microscopic identification of sedimentary rocks.
- Grainsize Analysis, Paleocurrent Analysis

Textbooks:

- ✓ *Nichols, G. (2009) Sedimentology and Stratigraphy Second Edition. Wiley Blackwell*
- ✓ *Boggs, S., 1995. Principles of Sedimentology and Stratigraphy, Prentice Hall, New Jersey.*

Suggested readings:

- ✓ *Prothero, D.R., & Schwab, F. (2004). Sedimentary geology. Macmillan.*
- ✓ *Tucker, M. E. (2006) Sedimentary Petrology, Blackwell Publishing.*
- ✓ *Hota, R.N. (2017) Practical approach to petrology, CBS Publishers and Distributors, New Delhi*