

Semester III
Paper 5: Sedimentology and Principles of stratigraphy

Origin of sediments. Weathering and sedimentary flux: Physical and chemical weathering, soils and paleosols. (3 lectures)

Fluid flow, sediment transport and sedimentary structures: Types of fluids, Laminar vs. turbulent flow, Boundary layer effect, Particle entrainment, transport and deposition. Concept of flow regimes and bedforms, sediment gravity flows (4 lectures)

Grain size scale, particle size distribution, particle shape and fabric. (2 lectures)

Sedimentary structure: Primary and secondary sedimentary structures, Paleocurrent analysis. (6 lectures)

Siliciclastic rocks: Conglomerates, sandstones, mudrocks. Concepts of diagenesis (4 lectures)

Carbonate rocks, controls of carbonate deposition, components and classification of limestone, dolomite and dolomitisation, carbonate sedimentary environments (8 lectures)

Principles of stratigraphy; Fundamentals of litho-bio-and chronostratigraphy (5 lectures)

Introduction to concepts of dynamic stratigraphy (chemostratigraphy, seismic stratigraphy, sequence stratigraphy) (4 lectures)

12 rounds of student presentations will be arranged in Groups on different topics covered under Theory

Practicals (12 lectures)

1. Exercises on sedimentary structures and their paleoenvironmental significance
2. Particle size distribution and statistical treatment
3. Paleocurrent analysis.
4. Exercises based on vertical sedimentary sequences of different terrestrial, coastal and marine environments
5. Petrography of clastic and non-clastic rocks through hand specimens and thin sections.

Titles of projects (extendable)

1. Flume experiments and understanding sedimentary structures
2. Sediment-organism interaction; interpretation of depositional energy
3. Combined flow? How do we recognize those?
4. Variations in depositional motif of sedimentary basins in different tectonic settings
5. Paleosol and clues for past climate

Suggested Readings

1. Prothero and Schwab, 2004, Sedimentary Geology, Freeman and Co. New York, 557p
2. Maurice E. Tucker, 2006, Sedimentary Petrology, Blackwell Publishing, 262p.
3. Collinson, J.D. and Thompson, D.B. 1988, Sedimentary structures, Unwin- Hyman, London, 207p.
4. Gary Nichols, 2009. Sedimentology and Stratigraphy Second Edition. Wiley Blackwell