

EGE 5101. Geomorphology and Sedimentology (4 credits)

Unit – 1

Fundamental concepts in geomorphology. Different models for the Evolution of landscape: Davis, Penck, King, Hack. Hill slopes: slope elements, classification, models of slope evolution, slope movement and stability factors. Landforms in relation to climate, rock type, structure and tectonics. Fluvial Geomorphology: Erosional and depositional landforms of rivers. Drainage systems and patterns. Morphometric elements and parameters - morphometric analysis of drainage basins. Coastal geomorphology: Coastal erosional and depositional landforms.

Unit – 2

Geomorphic indicators of neotectonic movements: Stream channel morphological changes, drainage modifications, fault reactivation, uplift–subsidence pattern in coastal areas. Application of geomorphology in various fields of earth sciences, viz. Mineral prospecting, Hydrogeology, Civil Engineering. Geomorphology of India – Origin and evolution of Peninsular India, Extra-peninsular India and the Indo-Gangetic Plain.

Unit – 3

Textural parameters of clastic and non-clastic sediments. Grain size: classification and concept of grade scale. Grain size estimation: direct measurement, sieving and settling methods. Grain size parameters (statistical) and their applications. Grain shape and fabric. Sedimentary structures: Classification and origin. Different types of stratification, deformation structures, erosional structures, biogenic structures, sand dykes and sills: applications in paleo-environmental and paleocurrent studies.

Unit – 4

Mineralogy, classification and depositional environments of conglomerate, sandstone, limestone and mud rock. Diagenesis: processes and evidence in siliciclastic, carbonate and argillaceous rocks. Provenance of sediments. Depositional environments - marine, non-marine, and mixed depositional environments. The association of primary sedimentary structures and textural characteristics with depositional environments and settings. Concept of sedimentary facies, association models. Overview of sedimentary basins; Basin development and classification: Cratonic basins, Divergent margin basins, Convergent margin basins, Downwarp basins. Fore arc and back arc basins. Sedimentary basins of India.

References

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