

Objectives:

1. To understand the processes that shape the landforms around us
2. To apply geomorphological concepts to problems of slope instability and try to identify the factors responsible for landslide occurrences in various environments

Unit I: INTRODUCTION TO GEOMORPHOLOGY

Geomorphology: Basic concepts; branches of geomorphology; historical geomorphology; process geomorphology: definition, introduction, measuring geomorphologic processes; endogenous and exogenous processes; tropics, marine, fluvial types and tools; processes of weathering and soil formation; mass movement, planation surfaces and geomorphic cycle definition; geomorphic systems: open, close, isolated system; geomorphic system dynamics: equilibrium and steady state

Unit II: FLUVIAL PROCESSES AND LAND FORMS

Drainage basin and network characteristics; drainage patterns: consequent, obsequent, antecedent, superimposed; genetic classification of streams, river valleys, work of river, sediment load, yield, and channel geometry; bedrock channels; classification of rivers and river metamorphosis; origin of lakes: types of origin – tectonic, volcanic, landslides, glacial, solution, fluvial action, wind, marine, organic, and meteorite impacts; karst landforms.

Unit III: AEOLIAN PROCESSES AND LANDFORMS

Aeolian landforms: sand deposits and types; age of desert, weathering in deserts, major causes of aridity; glacial forms: glacial erosion, deposition, and processes; glaciations during the Quaternary period in the Himalayas and other examples.

Unit IV: COASTAL PROCESSES AND FORMS

Coastal landforms, coral reefs, time-based coastal changes, coasts of the world; sea level changes, causes and neotectonism.

Unit V: NATURAL HAZARDS AND ENVIRONMENTAL MANAGEMENT

Slope processes: introduction, slope evaluation, classification, analysis, applied geomorphology, geomorphological importance, land use, infrastructural development, vulnerability assessment; models of sediment deposition due to natural hazards; studies in three and four dimensions; natural hazards and methods of environmental management.

Unit VI: REMOTE SENSING

Remote sensing: introduction, elements of interpretation, application to geomorphology; identification of landforms: palaeochannels, bajada, alluvial pans, river meanderings; geomorphology map preparation; site suitability analysis; coastal zone regulation.

Laboratory

Topographical map interpretation for different landforms, analysis of weathering trends, interpretation of geological and geomorphological changes.

TEXT BOOKS/REFERENCES:

1. Huggett R., (2007). Fundamentals of geomorphology (second edition). Routledge.
2. Small R J., (1978). Study of Landforms: A Textbook of Geomorphology. Cambridge University Press.
3. Thornbury W., (1969). Principles of geomorphology (second edition) John Wiley. New York.
4. Kale V.S. and Gupta A. Introduction to Geomorphology, Orient Longman, Hyderabad, 2001.
5. Holmes A. Principles of physical geology, Thomas Nelson and Sons, USA, 1964.
6. Goudie A.S. Geomorphology, Springer, UK, 1998.