

MANGALORE UNIVERSITY
Department of Marine Geology
MSc GEOINFORMATICS

GIS 454: APPLIED GEOMORPHOLOGY AND GEOENVIRONMENTAL SCIENCE

Course Outcome:

- CO1: Understand Earth's surface processes, relief configuration, landscape evolution, and subsurface composition.
- CO2: Identify different landforms and its processes.
- CO3: Use remote sensing and GIS for mapping of geomorphological characteristics of landforms

Unit 1	Concepts of Modern Geomorphology: Geomorphology and its applications in Natural resources inventory. Geomorphology and its applications to Geoinformatics.	08 hrs
Unit 2	Geomorphic Environments: The Fluvial Systems. Coastal and Marine geomorphology. Aeolian, Glacial, Karst and Dune Environments. M.O. Ridges, Ocean floor Topography.	08 hrs
Unit 3	Geomorphology and GIS in exploration of the natural environment. Impact of Slope, badlands, Pediments, Streams in geomorphic evolution. Geomorphic controls on the ground water resources of Coastal, Island and hinterland terrains. Geomorphological factors to be considered while selecting the solid waste disposal sites. Solid waste management and its impact on local and regional geomorphology.	08 hrs
Unit 4	Geo-hazards and geomorphic controls. Application of Remote Sensing and GIS in quantitative and Quantitative interpretations of 'risk area mapping' including forest fires, floods, earthquakes and Tsunami effected terrains.	08 hrs
Unit 5	General Introduction: Definition of Environmental, Environmental Pollutant, Environmental Pollution, Environment–Handling, Hazardous substance.	08 hrs
Unit 6	Environment Management Plan: Concepts and use of EMP in coastal and marine environments. Environment Impact Assessment Act: Definition, use and implementation for specific areas such as Marine Environments, Ports, Harbours, Recreation, Water Quality Standards for class SW-I waters, SW-II, SW-III, SW-IV, SW-V.etc., Noise Standards.	08 hrs
Unit 7	Coastal Regulation Zones: Concept of coastal Regulation Zones. Classification of Zones, Criteria of Zonation and Evolution of CEZ norms. Application of cartography, Remote sensing and GIS in mapping of Coastal Regulation Zones.	

Unit 8	Anthropogenic and Natural environmental Hazards: Reconnaissance mapping of Landslides and use of DEM. Use of GIS and Remote sensing in detection of water-spread areas including monitoring flood scenarios. Use of IKONOS and other digital data products in assessing damage due to earthquakes, Forest fires, flooding, etc. Impacts of Open-cast Mining and monitoring through multi-dated Remote Sensing and GIS techniques.	
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References

1. Fundamentals of Photogeology, Geomorphology – Verstappen – TTC Holland.
2. Thornbury, W. D., 2004, Principles of Geomorphology, CBS Publ., 5-570.
3. Wathern, P 1988, EIA: Theory & Practice. Unwin Hyman, London, 1-17.
4. Wood, C. 1995 EIA: A Comparative Review. Longman. 87-255.
5. Pethick, J. 1984. An introduction to Coastal Geomorphology, Edward Arnold, London, 259p.
6. Ritter, D.F., R.C. Kochel and J.R. Miller (2011) *Process Geomorphology, 5th edition*. McGraw Hill, NY. Rental text.
7. Summerfield, M.A. (Editor), 1991. Global Geomorphology: An introduction to the study of landforms, John Wiley and Sons Ltd., New York: 560p.
8. Thornbury, W.D. (1969): Principles of Geomorphology, Wiley Eastern Limited, New Delhi: 594 p.
9. Tinkler, 1985. A short history of Geomorphology, Croom-Helm, London.
10. Rice (1998): Fundamentals of Geomorphology.
11. Kale & Gupta (2001): Introduction to Geomorphology.

