



# MANGALORE UNIVERSITY

## DEPARTMENT OF MARINE GEOLOGY

### MGS 406: GEOMORPHOLOGY AND GEODYNAMICS

**Course Outcome:**

- CO1: Understand processes of weathering and erosion.
- CO2: Identify and describe different types of mass movements and various causes of mass movement.
- CO3: Describe geologic processes in relation to plate tectonics and continental drift.
- CO4: Able to identify geologic structures created by deformation and geomorphic features formed over various landforms.
- CO5: Various geomorphic features associated with various geomorphic agents can be distinguished.

#### Geomorphology

<b>Unit 1</b>	Nature and scope of Geomorphology, Fundamental concepts- Recent trends in Geomorphology. Approaches to geomorphology- static, dynamic, environmental and applied. Earth movements – Landforms - endogenetic and exogenetic, epirogenic and orogenic, climatic and tectonic factors and rejuvenation of landforms. Dynamics of geomorphology; geomorphic processes and resulting landforms.	8 hrs
<b>Unit 2</b>	Basic principles. Concepts of gradation, types of weathering and mass wasting. Concept of erosion cycles. Geomorphology of fluvial tracts, arid zones, coastal regions, Karst landscapes and glacial regions.	6 hrs
<b>Unit 3</b>	Applied Geomorphology: Flood management. Applications of geomorphology in mineral prospecting, Geomorphology of India with special reference to Karnataka.	6 hrs

#### Geodynamics

<b>Unit 4</b>	Introduction to Geodynamics. Seismic zones of India. Paleomagnetism: Polar wandering curve and magnetic reversals.	6 hrs
<b>Unit 5</b>	Plate Tectonics: Concept of Plate Tectonics. Major and minor plates. Mechanism of plate motion, Mantle convection. Rift Valleys.	6 hrs
<b>Unit 6</b>	Continental Drift: Concept and different lines of evidence. The concept of the Super continent - Gondwanaland and its fragments. Vertical Tectonics: Introduction to Vertical tectonics. Concept of Isostasy.	8 hrs

## List of References:

1. Physical Geology - Wm and C Brown - Montgomery, C.W. (1990)
2. An introduction to Coastal Geomorphology - Pethick, J. (1984), Edward Arnold, London, 259p.
3. *Process Geomorphology, 5th edition* - Ritter, D.F., R.C. Kochel and J.R. Miller (2011). McGraw Hill, NY. Rental text.
4. Global Geomorphology: An introduction to the study of landforms - Summerfield, M.A. (Editor), (1991). John Wiley and Sons Ltd., New York: 560p.
5. Principles of Geomorphology - Thornbury, W.D. (1969): Wiley Eastern Limited, New Delhi: 594 p.
6. A short history of Geomorphology - Tinkler (1985), Croom-Helm, London.
7. Fundamentals of Geomorphology - Rice (1998).
8. Introduction to Geomorphology - Kale & Gupta (2001).
9. The Evolving Continents - Brain F. Windley (1977), John Wiley & Sons. 385p.
10. The Geology of Continental Margins - Springer Verlag, NY - Burk C. A. & Drake, C. L. (1974).
11. Plate tectonics and Crustal Evolution - Condie, K.C. Pergamon Press, 288p.
12. Elemental Geosystems A foundation in Physical Geography - Christopherson, R. W. (1995) Printice Hall Inc., 580p.
13. Magnetic anomalies over ocean ridges - Vine, F. J., and Matthews, P. M. (1963) Nature, 199, 947-949.
14. The Interior of the Earth - Bott, M.H.P. (1982), Arnold, London, 316pp.
15. The Afro-Arabian Rift System - Khan, M. A., (1975). Sci. Prog.62, 207-236.
16. McElhinny, (1973) Palaeomagnetism and Plate Tectonics. Cambridge Univ. Press, 358p.
17. Ramachandra Rao, M. B. (1975). Outlines of Geophysical Prospecting: A manual for Geologist E.B.D. Educational Pvt. Ltd. Dehra Dun. 403p.
18. [Parasnis](#), D. S. (1979). Principles of applied Geophysics. Chapman and Hall, - 275p.
19. Dobrin, M.B. (1976). Introduction to Geophysical Prospecting. **New York McGraw-Hill, 630p.**
20. Geodynamics Elsevier - Artyushkov E.V. (1983)
21. The Dynamic Earth - John Wiley - Skinner, B.J. and Porter, S.C. (1995)
22. Earth Dynamics - BLOCK 4, The Open University Press - Open University Series (1982)
23. Earth Structure - BLOCK 2. The Open University press (1982) - Open University Series.
24. The Evolution Passive Continental Margins - The Royal Society of London (1980) in the Light of Deep Drilling Results. Phil, Trans R. Soc. London, A. 294.
25. Geophysics: Annette Bolger- Oxford Book Company: SalvadariGlanfausta et al- Springer.
26. Introduction to Coastal Processes & Geomorphology: Robin Davidson – Arnott - CUP.