

MGS 402: GEOMORPHOLOGY AND GEODYNAMICS

Skills, employability and entrepreneurship: This subject is a good opportunity for students not only to know about the formation of continents and the oceans, as well as shaping the earth surface features. This is useful to identify sites for tourism, urban development, mitigating geo-hazards and exploration of water, mineral and fossil fuel resources.

GEOMORPHOLOGY

Unit 1	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, epeirogenic and orogenic, climatic and tectonic factors and rejuvenation of landforms. Dynamics of geomorphology; geomorphic processes and resulting landforms.	8 hrs
Unit 2	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
Unit 3	Applied Geomorphology: Flood management. Applications of geomorphology in mineral prospecting, Geomorphology of India with special reference to Karnataka. Interactive sessions of teaching to enhance students-teacher interactions through hands-on demonstrations and exercises in the recent advancement of the subject related to the curriculum.	6 hrs

GEODYNAMICS

Unit 4	Introduction to Geodynamics. Seismic zones of India. Paleomagnetism: Polar wandering curve and magnetic reversals.	6 hrs
Unit 5	Plate Tectonics: Concept of Plate Tectonics. Major and minor plates. Mechanism of plate motion, Mantle convection. Rift Valleys.	6 hrs
Unit 6	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. Interactive sessions of teaching to enhance students-teacher interactions through hands-on demonstrations and exercises in the recent advancement of the subject related to the curriculum.	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 and Gupta (2001).
9. The Evolving Continents - Brian F. Windley (1977), John Wiley and Sons. 385p.
10. The Geology of Continental Margins - Springer Verlag, NY - Burk C. A. and 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: Salvadori Glanfausta et al- Springer.
26. Introduction to Coastal Processes and Geomorphology: Robin Davidson – Arnott - CUP.