



MANGALORE UNIVERSITY

DEPARTMENT OF MARINE GEOLOGY

MGH 403: STRATIGRAPHY AND PALAEOONTOLOGY

Course Outcome:

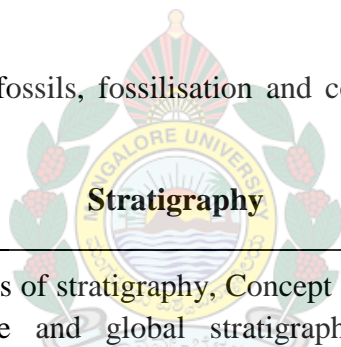
CO1: Familiarise with historical geology, correlate various rock formations or stratigraphic sections.

CO2: A detailed understanding of stratigraphy of India will be acquired.

CO3: Can describe various theories on origin of life, organic evolution, mass extinctions and their causes.

CO4: Explain the theory of biological evolution and how it explains the distribution, diversity, and extinction of organisms.

CO5: Can understand types of fossils, fossilisation and conditions required for preservation of fossils.



Unit 1	Introduction: Principles of stratigraphy, Concept of measurement of time, geological time scale and global stratigraphic chart. Stratigraphic classification: Litho, bio, chrono, seismic and magneto stratigraphic units and their inter-relationships. A brief review of global stratigraphy.	8 hrs
Unit 2	Physiographic and tectonic subdivisions of India; Evolution of the Indian subcontinent since the Archaean Eon.	4 hrs
Unit 3	Proterozoic basins of India with emphasis on lithological, geochemical, stratigraphic and geochronological aspects. Geological setting and important stratigraphic features of Phanerozoic formations in India such as Gondwanas, Deccan Traps, Indo-Gangetic Plain and Himalaya.	8 hrs
Unit 4	Boundary problem and its significance in stratigraphy with emphasis on the Cretaceous - Tertiary boundary. Importance of Cenozoic Era with reference to evolution of climate and life. Quaternary period: Glacial and inter-glacial epochs. Sea-level fluctuations, causes and consequences.	6 hrs

Palaeontology

Unit 5	Introduction. Theories on origin of life. Organic evolution, mass extinctions and their causes. Fossils, fossilisation, conditions required for preservation of fossils. Species concept, trace fossils, index fossils and pseudo-fossils. Modes of preservation of fossils (petrification, mould, cast, compressions, impressions, tracks, trails, burrows, foot prints and resting marks). Applications of fossils in stratigraphic correlation.	8 hrs
Unit 6	Invertebrate and Vertebrate fossils - Morphology, classification, evolution, age and stratigraphic importance of Porifera, Coelenterata, Brachiopoda, Mollusca, Arthropoda and Echinodermata. Siwalik vertebrate fauna.	6 hrs
Unit 7	Palaeobotany: Evolution of plant life, plant fossils and fossilization. Gondwana and Tertiary flora. Description of Algae, Spores and Pollen.	6 hrs
Unit 8	Micropalaeontology: Extraction of microfossils from sediments. Microfossil groups: Foraminifera, Ostracoda, Acritarcha, Radiolaria, Diatoms. Nannoplankton and Dinoflagellates. Applications of microfossils and trace fossils in Earth Sciences, Environmental significance and in hydrocarbon exploration.	8 hrs

List of References:

1. Stratigraphic Principles and Practice - M .J. Weller (1960).
2. Fundamentals of Historical Geology and Stratigraphy of India by Ravindrakumar - New Age International Publication.
3. Stratigraphy and Sedimentation, W.H. Freeman – Krumbein and Sloss (1963).
4. Principles of Paleontology – Raup and Stanley – CBS Publications.
5. Principles of Invertebrate Paleontology – Shrock and Twenhofel – CBS Publications.
6. Elemental Geosystem - Printice Hall, Inc.- R.W. Christopherson (1995)
7. The dynamic Earth: An introduction, Skinner & S.C. Porter, John Wiley and Sons.
8. Fossil Invertebrates, Cambridge Univ.- Lehmann, U and Hilimer, G. (1983)
9. Distribution and Ecology of Living Benthonic Foraminifera - Murry, J. (1973)
10. Principles of Micropaleontology, Hafner - Glassner, M.F. (1972)

11. Micropalaeontology, George Allen and Unwin -Brasier M.D. (1980)
12. Micropalaeontology, Graham & Trotman - Bignot, G. (1985)
13. Invertebrate Fossils, Mcgraw Hill - Moore, Lalicker and Fisher (1952)
14. Introduction to Micropalaeontology - Haq, B.U.
15. An introduction to Paleobotany - Arnold, Chester R.
16. Palaeontology - Invertebrate 8th Ed, CBS Publ. and Distributors - Woods Henry (1981).
17. Sedimentology and Stratigraphy: Gary Nichols - Willey Blackwell.

