

Course Type	Course Code	Name of Course	L	T	P	Credit
DE	NGLD306	Micropaleontology and Vertebrate Paleontology	3	0	0	3

Course Objective

The primary objective of the course is to familiarize students with microfossils, separation from sediments, their characteristics and different uses. This course is designed so that students can use their knowledge for exploration, paleoclimate, paleoceanography, and paleogeographic studies.

Learning Outcomes

Upon successful completion of this course, students will:

- Gaining knowledge about the microfossil groups & how they can be helpful for fossil fuel exploration
- Understanding paleoclimatic, paleoceanographic, and paleogeographic variations through micropaleontology
- The case study will be more helpful for the student to understand the objectives.

Unit No.	Topics to be Covered	Lecture Hours	Learning Outcome
1	Brief on groups of microfossils with their general stratigraphic distribution. Sampling & separation techniques. Core sample nomenclature.	5	A brief idea about groups of microfossils, their separation, and coring procedures.
2	Foraminifera: Morphology, ecology, ocean water physical properties. Ostracod: Brief description. Nannoplankton: brief description	5	Morphologic descriptions of microfossil groups will help to identify up to the genus or species level.
3	Application of microfossils: Biostratigraphy, depositional settings, fossil fuel exploration, paleoclimate.	10	This part considered applications of microfossils in terms of paleoceanography, paleoecology and paleogeography, biostratigraphy, and fossil fuel exploration.
4	Stable isotopes of microfossils. Use of microfossils: case studies	5	Use of $d^{13}C$ and $d^{18}O$ for paleoclimatic and hydrocarbon exploration.
5	General body plan of vertebrates, classification and characteristic features of vertebrates (Agnathans, Fishes, Amphibia, Reptilia, Aves, and Mammalia),	6	This part deals with a general description of vertebrate groups.
6	Dentition patterns, variation in molar teeth and their implication with biostratigraphy and habitat	3	Students will learn different dentition patterns, related food habits, and stratigraphic use of dentition patterns.
7	Adaptation, evolution, and biostratigraphic uses of Equids and Proboscidea	4	Knowledge will be imparted with respect to the adaptation and evaluation of horses, elephants, and man.
8	Evolution of Hominids	2	Evolution of Hominids and marker events through times
9	Dinosaurs and their extinction.	2	A brief description of a dinosaur and how it disappeared from the earth.
	Total	42	

Textbooks:

1. Saraswati, P. K., and Srinivasan, M. S. (2016). *Micropaleontology: Principles and Applications*. Fourth edition: Springer, Switzerland, pp. 1-223.
2. Armstrong, H., and Brasier, M., (2005). *Microfossils (2nd Edition)*. Blackwell Publishing, USA, pp. 1-296.
3. Benton, J. G., (2015). *Vertebrate Palaeontology (4th Edition)*, Wiley Blackwell, UK, pp. 1-453.

Reference Books:

1. Haq, B. U., and Boersma, A., (1998). *Introduction to marine micropaleontology (2nd Edition)*. Elsevier, Amsterdam, pp. 376.
2. Carroll, R. L., 1988. *Vertebrate Paleontology and Evolution*. WH Freeman, pp. 698.
3. Romer, A., *Vertebrate paleontology (3rd Edition)*. University of Chicago Press, pp. 687.