Practical Component- (30 Hours)
Chain survey
Plane Table survey
Total Station survey
Survey using GPS
Survey using Drone (if drone is available)
Map making

Essential/recommended readings

Surveying – Vol – I – By S.K.Duggal, Tata McGraw Hill Book Co.
Surveying – Vol – II – By S.K. Duggal, Tata McGraw Hill Book Co

Suggestive readings

Surveying – Vol – I – By S.K.Duggal, Tata McGraw Hill Book Co.
Surveying – Vol – II – By S.K. Duggal, Tata McGraw Hill Book Co

Note: Examination scheme and mode shall be as prescribed by the Examination Branch, University of Delhi, from time to time.

Credit distribution, Eligibility and Pre-requisites of the Course

Course title & Code	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course (if any)
		Lecture	Tutorial	Practical/ Practice		
GE-3 Fossils and Applications (L3, P1)	4	3	0	1	12th Pass (with science stream)	Nil

Learning Objectives

To provide some basic knowledge on fossils, their preservation in rocks and different groups of invertebrate, vertebrate and plant fossils. To impart knowledge on the utility of some of these fossils in determining the relative age of sedimentary rocks and implication in palaeoecological, palaeoenvironmental, palaeobiogeographical reconstruction. To equip the student with basic understanding of the role of fossils in hydrocarbon exploration.

Learning outcomes

Student will learn about different types of life forms that existed in the geological past. Students will learn about the evolutionary rates of certain important fossil groups and their role in dividing the rocks into distinctive units based on their stratigraphic ranges. Learn how fossils can be used in understanding the past environments, ecosystems, climate and distribution of land and sea. Student will also learn about the role of fossils in the exploration of fossil fuels.

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SYLLABUS OF GE-3

UNIT – I 9 hours)

Detailed contents

Introduction to fossils: Definition of fossil, fossilization processes (taphonomy), taphonomic attributes and their implications, modes of fossil preservation, role of fossils in development of geological time scale and fossil sampling techniques.

UNIT – II (9 Hours)

Detailed contents

Species concept: Definition of species, species problem in palaeontology, speciation, methods of description and naming of fossils, code of nomenclature.

UNIT – III (9 hours)

Detailed contents

Introduction to various fossils groups: Brief introduction of important fossils groups: invertebrate, vertebrate, microfossils, spore, pollens and plant remains. Important fossiliferous horizons of India

UNIT – IV (9 Hours)

Detailed contents

Application of fossils: Principles and methods of paleoecology, application of fossils in the study of paleoecology, paleobiogeography and paleoclimate; Role of fossils in palaeoenvironmental reconstructions.

UNIT – V (9 Hours)

Detailed contents

Societal importance of fossils: Implication of larger benthic and microfossil in hydrocarbon exploration: identification of reservoirs and their correlation. Application of spore and pollens in correlation of coal seams, spore and pollens as indicator of thermal maturity of hydrocarbons reservoirs, fossils associated with coal deposits, fossils as indicators of pollution.

Practical Component- (30 Hours)

Exercises on flexural isostasy.

Exercises related to settling of sediments.

Sediment flux exercises.

Preparation of river profiles (Hack Profile, calculation of SL index, Ksn).

Exercises related to fluvial geomorphology.

Exercises on rate of uplift and incision.

Essential/recommended readings

Clarkson, E.N.K.1998. Invertebrate Paleontology and Evolution, George Allen &Unwin

Prothero, D.R. 1998. Bringing fossils to life - An introduction to Paleobiology, McGraw Hill.

Suggestive readings

Clarkson, E.N.K.1998. Invertebrate Paleontology and Evolution, George Allen &Unwin

Prothero, D.R. 1998. Bringing fossils to life - An introduction to Paleobiology, McGraw Hill.

Benton, M.J. 2005. Vertebrate Palaeontology (3rd edition), Blackwell Scientific, Oxford.

Colbert's Evolution of the Vertebrates: A History of the Backboned Animals Through Time, Edwin H. Colbert, Michael Morales, Eli C. Minkoff, John Wiley & Sons, 1991.

Benton, M.J. & Harper, D.A.T. (2016). Introduction to Palaeobiology and the fossil record. Wiley.

Jones, R.W. (2011). Applications of Palaeontology - Techniques and Case Studies

Raup, D.M. & Stanley, S.M. (1985), Principles of Paleontology, W.H. Freeman and Company

Shukla, A. C. & Mishra, S.P. (1982). Essentials of Palaeobotany

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