

DISCIPLINE SPECIFIC CORE COURSE– DSC – 15: Geological Mapping (L2, P2)

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		
DSC – 15: Geological Mapping (L2, P2)	4	2	0	2	12th Pass with science	Studied Earth System Science, Structural Geology, and Mineralogy or Equivalent

Learning Objectives

This course on geological mapping to provide basic skills to carry out geological fieldwork in different terrains and prepare a geological map with all aspects related to lithology, structures, deformation patterns. Which is essential for basic understanding of geoscience and any detailed exploration activity.

Learning Outcomes

After going through this course, students will develop the following skills and knowledge about: How to identify a rock and broadly define its composition? How to identify and measure lithological and/or structural details of rocks at the outcrop/hand-specimen scale? How to plot the data on a base map/toposheet to create a lithological and/or structural map of the terrain? How to appreciate the possible origin of the rock and their genetic process. How to reconstruct the geological history of the terrain?

SYLLABUS OF DSC-15

Theory (30 hours)

UNIT – I (6 hours)

Introduction to toposheets and maps: Concepts of scale, contour density, numbering system. Global Positioning Systems, their types and uses. Choosing a suitable geological traverse.

UNIT – II (6 hours)

Outcrop geology: Pattern of beds in a undulating topography – rule of V. Identification of rock types, and their classification based on field criteria. Textural features of different rocks through field study and microscopy. Preparation of lithologs.

UNIT – III (6 hours)

Basic concept of structural measurements: Measurement of Strike, dip, trend, plunge, pitch etc. at the outcrop in the field. Distinguishing characters of planar and linear structures in the outcrop scale. Overprinting nature of folds/ metamorphic foliations etc.

UNIT – IV (6 hours)

Folds: Identification and structural measurement of a fold in the field. Geometric classification of a fold based on field data. Understanding the outcrop pattern of a fold in non-ideal sections

UNIT – V (6 Hours)

Faults: Distinguishing criteria of a fault in the field. Understanding the slip pattern of faults in an outcrop. Measuring the orientation of different planar and linear structures associated with a fault.

Practical Component- (60 Hours)

In the practical class, all the aforesaid techniques of measurement and identification will be demonstrated and practised in the field. The practical classes of this course will be conducted at a go through field visit (10 days) in a suitable geological terrain

Essential/recommended readings

Lahee F. H. (1962): Field Geology. McGraw Hill

Billings, M. P. (1987). Structural Geology, 4th edition, Prentice-Hall.

Lisle, R.J., Brabham, P., Branes, J. 2011. Basic Geological mapping, Wiley

Suggestive readings

Davis, G. R. (1984) Structural Geology of Rocks and Region. John Wiley

Park, R. G. (2004) Foundations of Structural Geology. Chapman & Hall.