Discipline Specific Elective (DSE-2): Introduction to Field Geology (L2, P2)

Or

One GE from GE pool (GE-4): Natural Hazards and Mitigation (T4, P0)

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)	No. of hours of Lectures	No. of hours of Tutorial	No. of hours of Practical	Total Hours of Teaching
		Lecture	Tutorial	Practical/ Practice						
DSE-2 **Introduction to Field Geology (L2, P1)**	**4**	**2**	**0**	**2**	**Class XII with Science**	**Studied Earth System Science and Structural Geology or Equivalent at the UG level**				

Learning Objectives

Learn to investigate various sedimentary features, structures and landforms in the field. To learn how to extract information about an area through the investigation of topographic maps.

Learning outcomes

Through this course, students will learn to: Identify sedimentary structures in field, Learn to measure grain size analysis in the field, Prepare litholog and its importance, Identify structures in the field, Prepare and interpret profiles from the topographic maps

SYLLABUS OF DSE-2

UNIT – I (6 Hours)

Rock Particles and Fragments: characters of larger rock fragments, pebbles etc.; Shape and surface markings; Dimensions of Particles and fragments; composition; shape; angular particles; subangular particles; rounded particles;

UNIT – II (6 Hours)
Sedimentary Structures: process of formation and their interpretation; laminae, bed, ripple marks, wave marks, rill marks, mud cracks, slump marks, cross-stratifications etc. Importance of litholog (theory)

UNIT – III (6 Hours)
Deformed rocks: Tilted and folded strata; Principal kinds of folds or flexures; Types of folds; Strike, dip, plunge and pitch; Classification of faults; kinds of displacement; principal evidences of faulting; relation of folds and faults; Topographic expression of folds and faults.

UNIT – IV (6 Hours)
Landforms in various environment: Fluvial landforms, coastal landforms, aeolian landforms, and glacial landforms.

UNIT – V (6 Hours)
Topographic maps and profile sections: Contours; spacing of contours; scale; direction; requisite data on a completed contour map.
Techniques used in examination of outcrops.

Practical Component- (60 Hours)

- **Measuring large grain sizes in the field (Grid method)**
- Identification of sedimentary structures
- Preparation of litholog
- Identification of landforms (glacial/fluvial/coastal/aeolian)
- Identification of folds and faults; evidences of faulting
- Construction of a profile section; Enlargement of profile section.
- Measurement of slope from the topographic map.
- Location in the toposheet thorough GPS/bearing
- Measurement of dip, strike, trend, plunge, pitch
- Identification of bedding, flow banding, metamorphic foliation

Essential
Field Geology by F.H. Lahee, CBS Publishers
Basic geological mapping, R. Lisle, Wiley-Blackwell, 2014

Recommended readings
Sedimentary Rocks in the field, M. Tucker, Wiley-Blackwell, 2011

***** DSE Courses of Tectonic Evolution of the Himalayas, and Applications of thermodynamics in Petrology to be inserted.**