

## **Approval: 16<sup>th</sup> Senate Meeting**

**Course Number:** CE-252

**Course Name:** Geology and Geomorphology

**Credits:** 2-0-2-3

**Prerequisites:** None

**Intended for:** UG

**Distribution:** Elective

**Semester:** Odd/Even

**Preamble:** All the civil engineering structures need a firm foundation to stand. Such foundation is mostly laid on either soil or rocks. Keeping this in view, the present course is designed which aims at familiarizing the basic concept about geology, rock formation, rock types and geomorphological features and thereby provides the required elementary knowledge for in-depth understanding about the formation of earth surface in later studies.

**Course Outline:** Two different broad themes of geology and geomorphology is being taught in this course. Starting with formation of Earth, plate tectonics, rock types and cycle highlighting the major minerals in the different types of rocks, their occurrence, weakness, and properties etc. In continuity, the formation of different features on surface of earth and the phenomenon governing them.

### **Lecture Modules:**

1. Introduction, importance and significance of Earth Science, General characteristics and origin of the Universe, Solar System and its planets. **(4 hours)**
2. Rock cycle, types and characteristics: Igneous, Sedimentary and Metamorphic rocks and their origin, texture, mineral composition, structure and classification. Rock properties **(5 hours)**
3. Plate tectonic theories, Physiographic sub divisions of India with focus on Himalayas. **(4 hours)**
4. Structural Geology: Dip, strike, faults, folds, joints, emphasizing on Himalayan terrain. **(6 hours)**
5. Basic concepts of Geomorphology, Cycle of erosion, Mountains and relief, river basin, drainage network, drainage types; **(5 hours)**
6. Geomorphic landforms, erosional & depositional: Fluvial, Glacial landforms. **(4 hours)**

### **Practical Modules:**

1. Identifying physical properties of rocks using visual interpretations. **(4 hours)**
2. Estimation of Hardness of rock using Mohr's Scale test. **(2 hours)**
3. Mineral identification using several properties. **(2 hours)**

4. Dip/ Strike measurements using brunton compass in and around campus. **(4 hours)**
5. Geological map reading and interpretations. **(4 hours)**
6. Geomorphological mapping and interpretation of maps. **(4 hours)**
7. Geological field mapping around the campus. **(8 hours)**

**Text Books:**

- a) Lutgens & Tarbuck, 'Essentials of Geology (with CD)', Pearson Education, 2012.
- b) P. Singh, 'Engineering and General Geology', S. K. Kataria and Sons, 2009.

**Reference Books:**

- a) A L. Bloom, 'Geomorphology: A systematic Analysis of Late Cenozoic Landforms - 3<sup>rd</sup> Ed.', Pearson Education, Inc., USA, 2004.
- b) Peter MacLaren Donald Duff, Donald Duff, 'Holme's Principles of physical geology', Chapman & Hall, 1992.
- c) F. G. Bell, 'Engineering Geology', Elsevier, 2007.
- d) V S. Kale, and A. Gupta, 'Introduction to Geomorphology'. Orient Longman Ltd., India, 2001.

**Similarity content declaration with existing courses:**

<b>Sl. No.</b>	<b>Course Code</b>	<b>Similarity Content</b>	<b>Approximate % of Content</b>
1	CE508	Geomorphology and its landforms	< 15%

**Justification for new course proposal if cumulative similarity content is > 30%:**