

1152CE142 (VTUR15)	<b>ENGINEERING GEOLOGY</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
		<b>2</b>	<b>0</b>	<b>0</b>	<b>2</b>

**Course Category:** Programme Elective

**A. Preamble**

Students undergoing this course are expected

- To develop an appreciation of geologic processes that influence civil engineering works.

**B. Prerequisites**

- NIL

**C. Link to other Course(s)**

- Basics of Dynamics and Aseismic Design of Structures

**D. Course Outcomes**

<b>CO Nos.</b>	<b>Course Outcomes</b>	<b>Level of learning domain (Based on revised Bloom's taxonomy)</b>
C01	Discuss the various types, forms of Rainfall and its Measurements	K2
C02	Estimate the Direct Measurement of Evapotranspiration.	K3
C03	Describe the Measurement of infiltration and Hydrograph.	K3
C04	Enumerate the various methods of Flood Routing.	K2
C05	Discuss the Ground Water Hydrology and its analysis.	K3

**E. Correlation of COs with POs**

<b>COs</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PO11</b>	<b>PO12</b>	<b>PSO1</b>	<b>PSO2</b>
CO1	H	M			M		H				M			
CO2		M				H	H	H			M			
CO3	M	M				M	H				M			
CO4	M	M					H				M			
CO5	M	M				H		H			M			

## **Course Content:**

### **UNIT I GENERAL GEOLOGY 6**

Introduction: Various branches of geology – Relevance of Geology in Engineering, Physical Geology: Geomorphic processes - Rock weathering - Formation of soils - soil profiles - soils of India, Geologic work and engineering significance of wind, rivers and oceans - Interior constitution of the earth -Various methods to study the interior - crust, mantle, core – lithosphere - Asthenosphere - composition of different layers - SIMA & SIAL.

### **UNIT II MINERALOGY 6**

Elementary knowledge on important crystallographic systems – physical properties of minerals – study of the following rock forming minerals – Quartz family, Feldspar family - Hypersthene group - hypersthene and Augite, Mica – muscovite and biotite, Calcite, Gypsum – properties, behavior and engineering significance of clay minerals.

### **UNIT III PETROLOGY 6**

Classification of rocks, Distinction between igneous, sedimentary and metamorphic rocks, Engineering properties of rocks, Description occurrence, engineering properties and distribution of following rocks - Igneous rocks – Granite, Dolerite and Basalt - Sedimentary rocks sandstone, Limestone, shale, Conglomerate and breccias, Metamorphic rocks-Quartzite, Marble, Gneiss and Schist.

### **UNIT IV STRUCTURAL GEOLOGY AND GEOPHYSICAL METHOD 6**

Definition-outcrop-stratification-dip and strike, Folds-definition- parts of fold-classification-relevance to civil engineering, Faults-definition-parts of a fault-classification- relevance to civil engineering - Joints-definition- classification, Geophysical methods – Seismic and electrical methods for subsurface investigations.

### **UNIT V GEOLOGICAL INVESTIGATIONS IN CIVIL ENGINEERING 6**

Remote sensing techniques – Study of air photos and satellite images – Remote sensing for civil engineering applications, Geological conditions necessary for design and construction of Dams, Reservoirs - Coastal protection structures. Landslide - types, causes and mitigation.

**TOTAL: 30 Periods**

## **TEXT BOOKS:**

1. Parbin Singh, “Engineering and General Geology”, S. K. Kataria & Sons, New Delhi, 2009.
2. Dimitri Pl Krynine, William R. Judd, “Principles of Engineering Geology and Geotechniques”, McGraw-Hill Book Company, New Delhi, 2005.

**REFERENCE BOOKS:**

1. Robert Ferguson Legget, Allen W. Hatheway “Geology and Engineering”, McGraw-Hill Book Company, New Delhi, 1998
2. F.G.H. Blyth, Michael de Freitas, “Geology for Engineers”, Published by Elsevier Ltd, 2006.