

B.Tech	IV Year	L	T	P	To	C
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**CE429 ENGINEERING GEOLOGY****Course Description and Objective:**

The course is intended to explore the scope of geology in terms of Civil Engineering applications and to explain the geological agents and their role in constantly moulding the surface of the earth.

**Course Outcomes:**

- Understand weathering process and mass movement
- Distinguish geological formations
- Identify geological structures and processes for rock mass quality
- Identify subsurface information and groundwater potential sites through geophysical investigations Apply geological principles for mitigation of natural hazards and select sites for dams and tunnels

**UNIT - I**

**Introduction** : Branches of Geology, Importance of geology from Civil Engineering Importance of Physical geology, Petrology and Structural geology.

**Physical Geology** : Weathering -process with reference to dams, reservoirs and tunnels weathering of common rock like "Granite".

**Mineralogy** : Definition of mineral, Importance of study of minerals, Different methods of study of minerals. Physical properties of minerals. Role of study of physical properties of minerals in the identification of minerals. Study of physical properties of following common rock forming minerals: Feldsper, Quartz , Flint, Jasper, Olivine , Augite , Hornblende, Muscovite , Biotite , Asbestos, Chlorite , Kyanite, Garnet, Talc, Calcite. Study of other common economic minerals such as Pyrite, Hematite, Magnetite, Chromite, Galena, Pyrolusite, Graphite, Magnesite, and Bauxite.

**UNIT - II**

**Petrology** : Definition of rock: Geological classification of rocks into igneous, Sedimentary and metamorphic rocks. Dykes and sills, common tructures and textures of igneous. Sedimentary and metamorphic rocks. Their

distinguishing features, Megascopic study of Granite, Dolerite, Basalt, Pegmatite, Laerite, Conglomerate, Sandstone, Shale, Limestone, Gneiss, Schist, Quartzite, Marble.

#### **UNIT – III**

**Structural Geology:** Out crop, strike and dip study of common geological structures associating with the rocks such as folds, faults unconformities, and joints - their important types. Earthquakes, their causes and effects, shield areas and seismic belts. Seismic waves, Richter scale, precautions to be taken for building construction in seismic areas. Landslides, their causes and effect; measures to be taken to prevent their occurrence. Importance of study of ground water, earth quakes and land slides.

#### **UNIT – IV**

**Geophysical methods:** Importance of geophysical studies principles of geophysical study by gravity methods. Magnetic methods, electrical methods. Seismic methods, radio metric methods and geothermal method. special importance of electrical resistivity methods and seismic refraction methods.

#### **UNIT – V**

**Geology of Dams and Reservoirs:** Types of dams and bearing of Geology of site in their selection, Geological Considerations in the selection of a dam site. Analysis of dam failures of the past. Factors Contributing to the success of a reservoir. Geological factors influencing water tightness and life of reservoirs.

**Tunnels:** Purposes of tunneling, Effects of Tunneling on the ground Role of Geological Considerations in tunneling, over break and lining in tunnels.

#### **TEXT BOOKS:**

1. K.V.G.K. Gokhale, "Principals of Engineering Geology", 1<sup>st</sup> ed., B.S Publications, New Delhi, 2005.
2. N.Chennakesavulu, "Engineering Geology", 2<sup>nd</sup> ed., MacMillan, India Ltd., New Delhi, 2009.

#### **REFERENCE BOOKS:**

1. D.Venkata Reddy, "Engineering Geology for Civil Engineers", 1<sup>st</sup> ed., Oxford & IBM Publishing Company Pvt. Ltd., New Delhi., 1997.
2. Parbin Singh, "Engineering & General Geology", 6<sup>th</sup> ed., S.K.Kataria & Sons, NewDelhi, 2001.
3. F.G. Bell, "Fundamental of Engineering Geology", 1<sup>st</sup> ed., B.S Publications, New Delhi, 2005.
4. Krynine & Judd, "Principles of Engineering Geology & Geotechnics", 1<sup>st</sup> ed., MC Graw-Hill Book Company, 1957.