CE/BOS/CE201/0412

K L UNIVERSITY

ENGINEERING GEOLOGY (11 – CE 201)

SYLLABUS

L	T	P	Cr
3	0	2	4

Introduction: Branches of geology, Importance of geology from Civil engineering point of view, Internal structure of the earth, PHYSICAL GEOLOGY: Introduction; Weathering Process of rocks and its importance in civil engineering; Soil formation, Soil profile; Geological action of Rivers, stages in a river system, drainage patterns.

Mineralogy: Definition of mineral; Significance of different physical properties of minerals. Study of Common rock forming minerals and their identification; Study of common rock forming minerals - Quartz, feldspar, Muscovite, Augite, Hornblende, Tourmaline, calcite, Talc, Haematite

Petrology: Igneous Rocks: Introduction; Rock Cycle, Formation of Igneous rocks; Structures and textures of Igneous rocks. SEDIMENTARY ROCKS: Formation of Sedimentary rocks; Structures and textures of Sedimentary Rocks. METAMORPHIC ROCKS: agents of metamorphism, Structures and textures of Metamorphic rocks, distinguisition of major rock types, ENGINEERING PROPERTIES OF ROCKS: Different Engineering property of rocks. Study of common Rocks – Granite - Basalt – Dolerite – Sand Stone – Lime Stone – Shale – Laterite - Granite gneiss – schist – Marble - quartzite – khondalite – Charnockite.

Structural Geology: Introduction; Strike and Dip; Outcrop. Types of Folds; Faults; Joints; Unconformities and their importance in Civil Engineering constructions.

Earthquakes and Seismic Hazards: Terminology; Classification, Causes and effects of earthquakes; Seismic belts, seismic hazards in India ; Civil Engineering considerations in seismic areas. A step towards urban earthquake vulnerability reduction LAND SLIDES: Classification; Causes and effects of Landslides; Preventive measures of Landslides.

Site Investigation Techniques for Civil Engineering Projects: Introduction, toposheets/topographic maps; Geological maps and their interpretation in site investigation; Geophysics in civil engineering, types of geophysical surveys; Remote sensing, Geographical information systems, application of RS & GIS in Civil Engineering Projects

Ground Water: Hydrological Cycle, sources of ground water, factors controlling ground water, water bearing properties of rocks and soils, types of aquifers, exploration of ground water.

Dams: Dams terminology; Types of dams; guidelines for major dam and reservoir investigations; Geology of some Indian Dam sites. TUNNELS: Purpose of tunneling; tunnels and underground excavations – methods of site selection, tunnel excavation in various rock types, Geology of some tunnel sites;

Text Books:

1. Engineering Geology by D. Venkat Reddy; Vikas Publishing House Pvt. Ltd., Noida
2. Engineering Geology and Geo techniques by Krynine and Judd, Mc Graw – Hill Book Company.

Reference Books:

1. Engineering and General Geology by Parbin Singh; S. K. Kataria & Sons, New Delhi.
2. Principles of Engineering Geology by K.M. Bangar, Standard Publications, Distributors, 1705-B, Nai sarak, New Delhi.
3. A text Book of Engineering Geology by N. Chennakesavulu; Macmillan India Ltd., Delhi.
4. Rock Mechanics for Engineers by Dr. B.P.Varma, Khana Publishers, Delhi-6.
5. Principles of Engineering Geology by KVGK Gokhale, B.S. Publications, Hyderabad.
6. Text Book of Geology, by P. K. Mukherjee, World Press (P) Ltd., Kolkata

LIST OF EXPERIMENTS

1. Study of physical properties of minerals.
   A) Rock forming minerals
   b) Economic minerals

2. Megascopic identification, structure and textural study of Rocks
   a) Igneous rocks
   b) Sedimentary rocks
   c) Metamorphic rocks

3. Study of geological maps

4. Study of structural geology models.

5. Study of tunnel models.

6. Study of river features.

7. Map reading and Base map preparation.

8. Drainage density.

9. Watershed delineation.

10. Slope analysis.

11. Land use land cover using satellite images

12. Electrical resistivity method for identification of ground water potential and thickness of strata – (demo).