

GUJARAT TECHNOLOGICAL UNIVERSITY

B.E Semester: 3 Mining Engineering

Subject Code 132203
Subject Name Geology-1

Sr.No	Course contents
1.	Earth Science and its branches. Introduction to geological Engineering
2.	Origin of Earth. Earth as a planet in the Solar System, Internal Structure of the Earth.
3.	The theory of Plate tectonics, Continental drifts, Mid-oceanic ridges. Island archs. Applications of the Plate tectonic theory.
4.	Degradational Geomorphic Processes: Weathering its type and agent. Erosion, Denudation and Soil profile. Importance of weathering and erosion in Civil Engineering. Geological work of river, glaciers, wind, sea and Ground water.
5.	Mineralogy : Physical properties of minerals. Brief introduction of following mineral families Quartz, Feldspar, Mica, Olivine, Pyroxene, Amphibole. Garnet, Physical properties of following rock forming minerals Quartz crystal, Jasper, Chert, Biotite, Muscovite, Orthoclase, Plagioclase, Microcline, Augite, Hornblende, Tourmaline, Nepheline, and Corundum. Physical properties of following industrial minerals Talc, Gypsum, Fluorite, Apatite, Beryl, Barite, Kyanite, Graphite. Physical properties of following ore minerals : Magnetite, Hematite, Galena sphalerite, Chalcopyrite, Bauxite, Chromite, Wolframite, Pyrolusite, Psilomelane, Pyrite and Pyrrhotite.
6.	Structural Geology : Bedding plane, Dip and Strike, Folds, Faults and unconformity: terminology classification and identification in the field and map. Geological maps and cross sections. Cross section preparation from individual maps of simple bedding, fold fault or unconformity.
7.	Stratigraphy : Principles of Stratigraphy. Geological Time Scale Early Earth and Precambrians of India. (Dharwar, Cuddapah, Aravavalli, Delhi, Malani and Vindhyan Supergroup).
8.	Elements of remote sensing. Aerial photo-interpretation for geological exploration in major Engineering projects. Geological mapping and preparation of Cross Sections, Subsurface exploration with pitting, trenching, shaft sinking and aditing. Their advantages and limitations. Drilling: Classification of drilling methods in various geological conditions. Advantages problems and limitations of drilling methods.

Reference Books:

1. A Text Book of Engg. & General Geology, Parbin Singh
2. Engineering Geology, K.M.Bangar
3. Engineering Geology, R.S.Kurmi
4. Physical Geology, Tyrell
5. Textbook of Geology, Dutta