GUJARAT TECHNOLOGICAL UNIVERSITY

Bachelor of Engineering
Subject Code: 3132203
Semester – III
Subject Name: GEOLOGY

Type of course: Regular

Prerequisite: Zeal to learn the subject

Rationale: Geology-1 is the basic study of earth and briefs about various minerals and their properties. It also covers the knowledge about geological disturbances occurs beneath the earth surface. During mining activities these geological information are very helpful to mining engineers for finding the best way of mineral extraction and planning.

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks				Total Marks
				Theory Marks		Practical Marks		
L	T	P	C	ESE (E)	PA (M)	ESE (V)	PA (I)	
4	0	2	6	70	30	30	20	150

Content:

Sr. No.	Content	Total Hrs
1	**Earth Science**:- Earth Science and its branches, Origin of Earth. Earth as a planet in the Solar System, Internal Structure of the Earth.	4
2	**Engineering Geology:-** Introduction to geological engineering, Branches of geology, scope of geology in Mining engineering.	6
3	**Plate Tectonics**:- The theory of Plate tectonics, Continental drifts, Mid-oceanic ridges. Island archs, Applications of the Plate tectonic theory.	12
4	**Degradational Geomorphic Processes**: Weathering its type and agent. Erosion, Denudation and Soil profile. Geological work of river, glaciers, wind, sea and Ground water.	12
5	**Mineralogy**: Physical properties of minerals. Brief introduction of following mineral families:- Quartz, Feldspar, Mica, Olivine, Pyroxene, Amphibole , Garnate, Physical properties of following rock forming minerals :- Quartz crystal, Jasper, Chert, Biotite, Muscovite, Orthoclase, Plagioclase, Microcline, Augite, Hornblande, 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,	8

	Hematite, Galena sphalerite, Chalcopyrite, Bauxite, Chromite, Wolframite, Pyrolusite, Psilomelence, 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.	**8**
7	Stratigraphy: Principles of Stratigraphy. Geological Time Scale Early Earth and Precambrains of India. (Dharwars, Cuddapah, Aravavalli, Delhi, Malani and Vindhyan Supergroup).	**6**
8	Elements of remote sensing. Aerial photo-interpretation for geological exploration n 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.	**10**

Suggested Specification table with Marks (Theory):

Distribution of Theory Marks					
R Level	U Level	A Level	N Level	E Level	C Level
25	**20**	**20**	**20**	**15**	**00**

Legends: R: Remembrance; U: Understanding; A: Application, N: Analyze and E: Evaluate C: Create and above Levels (Revised Bloom's Taxonomy)

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

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

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Course Outcomes:

Sr. No.	CO statement	Marks % weightage
CO-1	To know and understand the internal and outer structure of earth.	10 %
CO-2	To know about geological changes occurring on land, river, sea, glacier, etc. done by the environment.	25 %
CO-3	To know about various minerals, their differing properties and also the structure, thereby gaining the knowledge for identifying minerals.	35 %
CO-4	To know various technologies used for searching minerals and different geological maps consisting geological disturbances.	30 %

List of Experiments:

(1) Study of internal and external structure of earth
(2) Study of various tectonic plates.
(3) Physical properties of different minerals.
(4) Study of different geological disturbances in rocks.
(5) Geological Time Scale of the Earth.
(6) Study of Aerial photography in searching minerals.

List of Open Source Software/learning website:

(1) Laboratory Samples of various Rocks and Minerals.

(2) Laboratory models for various Geological structures.

(3) Laboratory models for various Geological diturbances.

(4)Geological Maps, sections and charts.