GUJARAT TECHNOLOGICAL UNIVERSITY

MINING (22)

GEOLOGY-I

SUBJECT CODE: 2132203

B.E. 3RD SEMESTER

Type of course: Geology

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
L	T	P	C	Theory Marks			Practical Marks			
				ESE (E)	PA (M)		PA (V)		PA (I)	
					PA	ALA	ESE	OEP		
3	0	2	5	70	20	10	20	10	20	150

Content:

Sr. No.	Topics	Teaching Hrs.	Module Weightage
1	Earth Science and its branches. Introduction to geological Engineering	04	
2	Origin of Earth. Earth as a planet in the Solar System, Internal Structure of the Earth.	06	
3	The theory of Plate tectonics, Continental drifts, Mid-oceanic ridges. Island archs. Applications of the Plate tectonic theory.	06	
4	Degradational Geomorphic Processes: Weathering its type and agent. Erosion, Denudation and Soil profile. Important of weathering and erosion in Civil Engineering. 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. Granet, 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, Hematite, Galena sphalerite, Chalcopyrite, Bauxite, Chromite, Wolframite, Pyrolusite, Psilomelence, Pyrite and Pyrrhotite.	16	
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	10	

	section preparation from individual maps of simple bedding, fold fault or unconformity.		
7	Stratigraphy: Principles of Stratigraphy. Geological Time Scale Early Earth and Precambrains of India. (Dharwars, Cuddapah, Aravavalli, Delhi, Malani and Vindhyan Supergroup).	06	
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	

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

Course Outcome:

1. To know and understand the internal and outer structure of earth.
2. To know about geological changes occurring on land, river, sea, glacier, etc. done by the environment.
3. To know about various minerals, their differing properties and also the structure, thereby gaining the knowledge for identifying minerals.
4. To know various technologies used for searching minerals and different geological maps consisting geological disturbances.
5. To gain knowledge about drilling techniques for the extraction of minerals.

List of Practicals:

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.

Open Ended Problems:

1. Prepare a chart describing different physical properties of various minerals.
2. Prepare contour maps on different geological disturbances like folds, faults, unconformity, etc.

ACTIVE LEARNING ASSIGNMENTS: Preparation of power-point slides, which include videos, animations, pictures, graphics for better understanding theory and practical work – The faculty will allocate chapters/ parts of chapters to groups of students so that the entire syllabus to be covered. The power-point slides should be put up on the web-site of the College/ Institute, along with the names of the students of the

group, the name of the faculty, Department and College on the first slide. The best three works should submit to GTU.