GUJARAT TECHNOLOGICAL UNIVERSITY

MINING ENGINEERING (22)

GEOLOGY-II

SUBJECT CODE: 2142203

B.E. 4th SEMESTER

Type of course: N.A

Prerequisite: Zeal to learn the subject

Rationale:

Students can use their gained knowledge of Geology for mine planning & excavation of rocks, ores, minerals etc. economically, which involves knowledge of targeted deposit based on proper studies and assessment. This course empowers students with such necessary knowledge of geological deposits and its estimation for economical mining.

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	**Agradational Geomorphic Process:** Earthquakes definition, Geological causes, measurement (Magnitude and intensity), Seismic-zones of India, Aseismic designs, Volcanoes their types products and distribution. Mountains-their types, genesis and distribution.	05	12 %
2	**Igneous Rocks:** Forms of Igneous rocks. Tabular classification of Igneous rocks. Texture, structures and cooling history of Igneous rocks, Crystallization of uni-component and bi-component magma. Petrological characters of Granite, Syenite, Gabbro, Anorthosite, Dunite, Peridotite, Pegmatite, Rhyolity, Basalt.	06	13 %
3	**Sedimentary Rocks:** Formation of Sedimentary rocks. Classification of Sedimentary rocks. Texture and Structures. Characteristics of conglomerate, Breccia, Sandstone, Siltstone, Shale, Limestone, dolomites and Phospherite.	06	13 %

4	**Metamorphic Rocks:** Kind and agents of metamorphism. Textures and Structures of Metamorphic rocks. Metamorphic facies and grade. Characteristics of Gneiss, Phyllite Schist, Slate, Quartzite, Eclogite, Granulite.	06	13 %
5	**Structural Geology:** Multi generation folding. Lineation, Schistosity and Joints. Geological maps showing various combinations of fold fault, unconformity and intrusives.	12	28 %
6	**Phanerozoic Stratigraphy:** Marwar Supergroup and Cambrians of salt range. Gondwana Supergroup. Deccan Traps. Mesozoics of Gujarat and Rajasthan. Siwalik Supergroup. Origin of Indogangetic alluvium, Thar desert and Himalaya.	04	08 %
7	**Tunnels:** Terminology and Classification, Hazards and influence of geological factors at tunnel sites (including, structural, Lithological and Ground water). Indian Tunnels. Geological investigations at Dem preventive measures of land-slides.	06	13 %

Suggested Specification table with Marks (Theory):

Distribution of Theory Marks				
R Level	U Level	A Level	N Level	E Level
20	20	08	14	08

Legends: R: Remembrance; U: Understanding; A: Application, N: Analyze and E: Evaluate 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.

Course Outcome:

After learning the course the students should be able to:

1. To know about earthquakes volcanoes and its causes.
2. To know classification of rocks based on its formation & their textures, structures and other Characteristics.
3. To know about various geological disturbances & its reasons of formation in structural geology.
4. To get idea about required geological investigation for selection of site for Tunneling & associated Problems & remedies.

List of Experiments:

Following experiments are suggested for Laboratory work

1. Megascopic study of rocks: Study of Physical properties, texture, structure pathogenesis of igneous rock.
2. Megascopic study of rocks: Study of Physical properties, texture, structure pathogenesis of sedimentary rock.
3. Megascopic study of rocks: Study of Physical properties, texture, structure pathogenesis of metamorphic rock.
4. Sketch of model showing different types of faults and folds.
5. Study of marwar supergroup and gondwana supergroup.
6. Study of influence of geological factors at tunnel sites.

Important Note:

80 % From above suggested laboratory work should be covered and remaining 20 % is as per facility available at Department.

Design based Problems (DP)/Open Ended Problem:
All above performance are to be carried out in the laboratory and students will prepare experiments and note down reading and conclusion. The can prepare for calibration and compare results with existing and with alternate methods of measurements. At least 5 open ended problems are proposed for better understanding the subject and to apply real life application. The projects are listed below:

1. Calibration of brunton compass.
2. Calibration of clinometer.
3. Setup preparation and experiments on angular measurements

Major Equipment:

1. Geological models.
2. Various types of rocks specimen.
3. Brunton compass and clinometers.
4. Various types of structural models showing dip, strike, fault, fold etc.

List of Open Source Software/learning website:

1. http://en.wikipedia.org/wiki/Geology
2. http://geology.about.com/
3. http://geology.com/
4. www.youtube.com
5. www.nptel.com

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.