

GUJARAT TECHNOLOGICAL UNIVERSITY

MINING ENGINEERING (22)
MINING GEOLOGY
SUBJECT CODE: 3142208
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:

TeachingScheme			Credits C	ExaminationMarks				Total Marks
L	T	P		TheoryMarks		PracticalMarks		
				ESE (E)	PA(M)	ESE (V)	PA (I)	
3	0	2	4	70	30	30	20	150

Course 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	06	13%

	and grade. Characteristics of Gneiss, Phyllite Schist, Slate, Quartzite, Eclogite, Granulite.		
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 D 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, student will be able to:

1. Identify causes due to which earthquakes, volcanoes and mountains occur; as well as their work on earth.
2. Classify rocks based on its formation, texture, structure and other characteristics.
3. Identify various geological disturbances & its formation in structural geology.
4. Select tunnel site based on geological investigations; and will be able to solve dam associated problems.

List of Experiments:

Sr. No.	Experiments
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 gondwanasupergroup.
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. They 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