



GUJARAT TECHNOLOGICAL UNIVERSITY

Program Name: Bachelor of Engineering

Level: UG

Branch: Mining Engineering

Subject Code: BE04022051

Subject Name: Mining Geology - II

w. e. f. Academic Year:	2024-25
Semester:	4
Category of the Course:	Basic Science Courses

Prerequisite:	BE03022041 - Mining Geology - I
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.

Course Outcomes:

Sr. No.	CO statement	Marks% weightage
CO-1	Identify causes due to which earthquakes, volcanoes and mountains occur; as well as their work on earth.	10
CO-2	Classify rocks based on its formation, texture, structure and other characteristics.	20
CO-3	Identify various geological disturbances & its formation in structural geology.	20
CO-4	Select tunnel site based on geological investigations; and will be able to solve dam associated problems.	20

Teaching and Examination Scheme:

Teaching / Learning Scheme (in Hours per semester)					Total Credits	Assessment Pattern and Marks					Total Marks
L	T	P	SL	Total no of hours per semester		Theory		Tutorial / Practical			
						ESE (E)	PA / CA (M)	PA/ CA (I)	TW/ SL (I)	ESE (V)	
45	0	30	15	90	3	70	30		50	50	200



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Content:

Sr. No.	Content	Total Hrs
1	Introduction A gradational Geomorphic Process: Earthquake's 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
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, Dunnite, Peridotite, Pegmatite, Rhyolite, Basalt.	06
3	Sedimentary Rocks: Formation of Sedimentary rocks. Classification of Sedimentary rocks. Texture and Structures. Characteristics of conglomerate, Breccia, Sandstone, Siltstone, Shale, Limestone, dolomites and Phosphorite.	06
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
5	Structural Geology: Multi generation folding. Lineation, Schistosity and Joints. Geological maps showing various combinations of fold fault, unconformity and intrusive.	12
6	Phanerozoic Stratigraphy: Marwa Supergroup and Cambrians of salt range. Gondwana Supergroup. Deccan Traps. Mesozoic of Gujarat and Rajasthan. Siwalik Supergroup. Origin of Indo genetic alluvium, Thar desert and Himalaya.	04
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
TOTAL		45

Suggested Specification table with Marks (Theory): (For B.E. only)

Distribution of Theory Marks					
R Level	U Level	A Level	N Level	E Level	C Level
20	20	08	14	08	00

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



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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:

S. No.	Titles	Author(s)	Publisher and Edition with ISBN
1.	A Text Book of Engg. and General Geology	Parbin Singh	S. K. Katariya and Sons 978-9350142677
2.	Principals of Engineering Geology	K.M. Bangar	Standard Publishers Distributors 978-8180141157
3.	Fundamentals of Engineering Geology	RS Khurmi	VISIONIAS Ltd. B0CWYXWB45
4.	Principles of Petrology	G. W. Tyrrell	Aitbs Publishers and Distributors 978-9374735275
5.	Physical Geology	AK Datta	VISIONIAS ltd B0CWYY7D1Q

List of Experiments:

- Megascopic study of rocks: Study of Physical properties, texture, structure pathogenesis of igneous rock.
- Megascopic study of rocks: Study of Physical properties, texture, structure pathogenesis of sedimentary rock.
- Megascopic study of rocks: Study of Physical properties, texture, structure pathogenesis of metamorphic rock.
- Sketch of model showing different types of faults and folds.
- Study of Marwa supergroup and Gondwana supergroup.
- Study of influence of geological factors at tunnel sites.

Major Equipment:

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

List of Open-Source Software/learning website:

- <http://en.wikipedia.org/wiki/Geology>
- <http://geology.about.com/>
- <http://geology.com/>
- www.youtube.com
- www.nptel.com



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- **List of suggested activities for Problem Based Learning:**

a. **Assignments:** (Seminar Topics/ Visits/Self-Learning Topics) Questions/Problems/Numerical/Exercises to be provided by the course teacher in line with the targeted COs.)

- i. Laboratory chart preparation of igneous, metamorphic and sedimentary rock.
- ii. Laboratory chart preparation of geological disturbances.
- iii. Design of factors affecting on Tunnels sites.

b. **Micro Projects:** A Suggested list of course-wise micro-projects is mentioned herewith

- i. Calibration of Brunton compass
- ii. Calibration of Clinometer
- iii. Setup preparation and experiments on angular measurements.
