

# Gujarat Technological University

## COURSE NAME: INTRODUCTION TO MINING & GEOLOGY

### 1. RATIONALE:

The diploma holders in Mining Engineering will be responsible for carrying out mining operations after locating a mineral rich area by exploration & also his responsibility extends towards preparing mine plans of the area in various Geological Condition like structurally complex area, Varied hydrogeological Conditions etc. The Course Content of the subject includes basic terminologies, Various techniques of exploration, knowledge of various wealthier mineral Resources, Rock formation their importance in brief. By that way it helps in preparing platform for the Mining Engineering Student towards the Mining Environment.

### 2. SCHEME OF TEACHING

Topic No.	Name of Topic	No of Hours		
		Lect.	Pract.	Total
	<b>MINING</b>			
1.	Minerals used in Industries	02	--	02
2.	Exploration agencies.	01	--	01
3.	Methods of exploration.	02	--	02
4.	Types of Deposits.	02	--	02
5.	Approach to Ore bodies.	02	--	02
6.	Excavation of Minerals	02	--	02
7.	Mining methods.	02	--	02
8.	Surface mining.	04	--	04
9.	U/G Mining of coal	02	--	02
10.	Mining Legislations and Management	03	--	03
	<b>GEOLOGY</b>			
11.	Geology Introduction.	01	--	01
12.	Erosion and Sedimentation	03	--	03
13.	Igneous mineralization.	02	--	02
14.	Metamorphic rocks.	02	--	02
15.	Geological disturbance.	02	--	02
16.	Economic mineral deposits.	02	--	02
17.	Formations, Mining Production etc.	06	--	06
18.	Mining areas of Gujarat	02	--	02
	<b>Total</b>	<b>42</b>	<b>--</b>	<b>42</b>

### 3. OBJECTIVES:

- (i) By learning this, Student will be aware of all the basic terminologies mainly used in Mining & Geological atmosphere.
- (ii) Student will be acquainted with the Mining environment.
- (iii) The Course Content will lead the Student for further Mining & Geological Studies at progressive level.

### 4. TOPIC AND SUB-TOPICS:

#### 1. MINERALS USED IN INDUSTRIES:

- 1.1 Metals, Alloys- Fuels,-Refractory-Cement-etc.

#### 2. EXPLORATION AGENCIES:

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- 2.1 G.S.I., M.E.I. State Coal. Dept.  
Reports,survey of India Topo sheets etc.

## **3. METHODS OF EXPLORATION:**

- 3.1 Drilling, Boring, Pitting, Trenching, sampling, Assaying deliening of ore body.

## **4. TYPES OF DEPOSISTS:**

- 4.4 Mineral bodies, outcroppings, bedded, veins etc. hilly etc.

## **5. APPROACH TO ORE BODIES:**

- 5.5 Surface, drifts, shafts etc.

## **6. EXCAVATION OF MINERALS:**

- 6.1 Drilling, Blasting, loading, transport of minerals etc.

## **7. MINING METHODS:**

- 7.1 Mining methods, Open cast coal/ Lignite/ Limestone etc.
- 7.2 Mining methods of vein deposits.

## **8. SURFACE MINING:**

- 8.1 Case studies - coal/ lignite/etc.
- 8.2 Surface mining of limestone, Bauxite/Iron ore case studies

## **9. UNDERGROUND MINING OF COAL:**

## **10. MINING LEGISLATIONS AND MANAGEMENT:**

- 10.1 Legislations, safety and mine plans etc.
- 10.2 Genral management.

## **11. GEOLOGY INTRODUCTION:**

- 11.1 Earth- Common building materials, clay, soil, sand, road metals etc.

## **12. EROSION AND SEDIMENTATION:**

- 12.1 Erosions, weathering, transportation, deposition etc.
- 12.2 Sedimentation rocks etc.

## **13. IGNEOUS MINERALIZATION:**

- 13.1 Igneous -mineralization - metals - veins, granites -basalt traps etc.

## **14. METAMORPHIC ROCKS:**

- 14.1 Metamorphic rocks slate, marble etc.

## **15. GEOLOGICAL DISTURBANCES:**

- 15.1 Geological disturbances, faults, folds, etc.

## **16. ECONOMIC MINERAL DEPOSITS:**

- 16.1 Different economic mineral deposits-in sedimentary and igneous rocks etc.

## **17. FORMATIONS, MINING PRODUCTION ETC:**

- 17.1 Formations, major mining centres, production etc for coal/lignite, Iron ore/ Manganese.
- 17.2 Refractory minerals like fire clays, china clays, magnesite, Bauxite etc.

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## 18. MINING AREAS OF GUJATAT:

18.1 Major mining areas of limestone/ lignite etc of

One visit to lignite open cast mine or other open cast mines for metals to acquaint students with mining environment.

Visit to nearest areas of interest of Directorate of Geology and mines (DGM) for their new resources of lignite and oil production, drilling activities carried out by ONGC.

## 5. SUGGESTIVE INSTRUTIONAL STRATEGIES:

Topic No.	Name of Topic	Instuotional Strategies	Key resource Needed
	<b>MINING</b>		
1.	Minerals used in Industries	Demo.	Samples
2.	Exploration agencies.	"	Charts
3.	Methods of exploration.	"	"
4.	Types of Deposits.	"	"
5.	Approach to Ore bodies.	"	"
6.	Excavation of Minerals	"	Slides
7.	Mining methods.	"	Film
8.	Surface mining.	"	"
9.	U/G Mining of coal	"	"
10.	Mining Legislations and Management	"	Chart
	<b>GEOLOGY</b>		
11.	Geology Introduction.	--	--
12.	Erosion and Sedimentation	Demo.	Photographs
13.	Igneous mineralization.	"	"
14.	Metamorphic rocks.	"	Samples
15.	Geological disturbance.	--	--
16.	Economic mineral deposits.	Demo.	Chart
17.	Formations, Mining Production etc.	"	Photographs
18.	Mining areas of Gujarat	"	Chart

## 6. REFERENCES:

- |                                   |                    |
|-----------------------------------|--------------------|
| (1) Engineering & General Geology | Parbin Sing        |
| (2) Coal Mining                   | B. Ghosh           |
| (3) Mining Geology                | R.M.P. Arogyaswami |
| (4) Mining Geology                | H.E. Makinsly      |
| (5) Mining Geology                | Mickinstry         |
| (6) Elements & Mine technology    | D.J. Deshmukh      |
| (7) Open Cast Mining              | B.Ghash            |
| (8) Open Cast Mining              | R.T. Deshmukh      |