

GUJARAT TECHNOLOGICAL UNIVERSITY

Diploma in Mining Engineering

Semester: 3

Subject Code

Subject Name MINING - I

Sr. No.	Course content
1.	BORING : 1.1 Chief uses of boreholes, percussive method by rigid rods, rope drilling, boring tools used in percussive method. 1.2 Rotary Boring-various systems, different types of bits, water flushing & mud flushing, core recovery, single tube & double tube core barrel, wire line core barrel, diamond drilling. 1.3 Trouble during boring operations - caving of wall of bore hole, loss of water, deviation of bore hole. survey of bore holes, loss of bit, rod damage or disengagement inside the hole, excessive wear of bit, breakage or loss of diamond.
2.	EXPLOSIVES & BLASTING: 2.1 Definitions of explosives, constituents of explosives, 2.2 Classification of explosives (i) Low & High Explosives (ii) Permitted & Non permitted explosives. 2.3 Detonators & Accessories (i) Different types of detonators, advantage of delay detonators. (ii) Safety fuse, detonating fuse. (iii) Simultaneous and delay action firing. 2.4 Exploders: Different types, construction and safety features of exploders. 2.5 Blasting practice in mines: (i) Shot-firing tools (ii) Preparation of charge (iii) Procedure for firing shots, (iv) Direct & Indirect initiation, stemming material, water ampules, cushion firing (v) Blasting efficiency, - consideration of factors (vi) Calculation of explosive quantity, powder factor, detonator factor, 2.6 Solid blasting: Blasting of solids, advantages and disadvantages, precautions and restrictions, pattern of shot holes. 2.7 Alternative to explosives - Cordex Hydrox, Hydraulic burster, Armstrong air breaker, their advantages & disadvantages. 2.8 Magazine - layout, construction & safety features.- Handling of explosives. 2.9 Common causes of accidents from explosives, Misfired shots, blown through & blown out shots, causes & Dangers, remedial measures required. Relevant provisions of Coal / Metaliferous Mines. Note : Mines Regulation to be discussed - but questions not to be set from regulations in exams.

LABORATORY EXPERIENCES :

1. Study of accessories of boring machines and boring rig.
2. Study, sketch & use of the boring and fishing tools.
3. Study and sketch of Hydraulic feed mechanism of the drilling machine.
4. Study and sketch of double tube core barrel
5. Study and sketch of various types of detonators and relay
6. Study of different types of exploders
7. Study of construction and use of stemming rods, scraper cum break detector, blasting cable, circuit tester etc
8. Study and sketch of approved types of explosive magazines
9. Study & sketch of different types of initiation
10. Study & sketch of Hydraulic Burster / Cordex.

REFERENCES:

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|----------------------------------|---------------|
| 1. Elements of Mining Technology | D.J.Deshmukh |
| 2. Introduction of Mining | Lewis & clark |
| 3. Drilling Technology | Chugh |
| 4. Elements of Mining | Arogyaswamy |