MINING ENGINEERING

Administrator

BHAGWANT UNIVERSIRTY

BHAGWANT UNIVERSITY
Sikar Road, Ajmer
Rajasthan

Syllabus

Institute of Engg. & Technology
Diploma
(Mining Engineering)

2nd YEAR

Subject Code	Subject Name	Hours Per Week				Distribution of Maximum Marks					
						University Exam			Practical Exam		
		L	T	P	Total	Internal	External	Total	Internal	External	Total
02DYMI101	MINING	2	-	-	2	30	70	100	-	-	-
02DYMI102	MINING MACHINERY - I	2	-	-	2	30	70	100	-	-	-
02DYMI103	MINING GEOLOGY-I	2	-	-	2	30	70	100	-	-	-
02DYMI104	SURVEYING	2	-	-	2	30	70	100	-	-	-
02DYMI105	MINE SAMPLING ASSAYING AND MINERAL DRESSING	2	-	-	2	30	70	100	-	-	-
02DYMI106	MINE SURVEYING -I	2	-	-	2	30	70	100	-	-	-
02DYMI107	SURFACE MINING	2	-	-	2	30	70	100	-	-	
02DYMI108	MINING MACHINERY - II	2		-	2	30	70	100			
02DYMI109	MINING GEOLOGY-II	2		-	2	30	70	100			
02DYMI110	MINE ELECTRICAL ENGINEERING	2			2	30	70	100			
	PRACTICALS										
02DYMI201	MINING LAB	-	-	2	2	-	-	-	50	-	50
02DYMI202	MINING MACHINERIES LAB	-	-	2	2	-	-	-	50	-	50
02DYMI203	MINING GEOLOGY LAB	-	-	2	2	-	-	-	50	-	50
02DYMI204	SURVEYING PRACTICES– LAB	-	-	2	2	-	-	-	50	-	50

02DYMI205	MINE SAMPLING ASSAYING AND MINERAL DRESSING	-	-	2	2	-	-	-	50	-	50
02DYMI206	MINE SURVEYING LAB	-	-	2	2	-	-	-	50	-	50
02DYMI207	SURFACE MINING LAB	-	-	2	2	-	-	-	50	-	50
02DYMI208	MINING MACHINERY – II LAB			2	2				50	-	50
02DYMI209	MINING GEOLOGY-II LAB			2	2				50	-	50
02DYMI301	DISCIPLINE & EXTRA-CURRICULAR ACTIVITIES	-	-	-	-	-	-	-	50		50
TOTAL		**18**	**-**	**18**	**36**	**210**	**490**	**1000**	**500**		**500**

Grand Total-1500

3rd YEAR

Subject Code	Subject Name	Hours Per Week				Distribution of Maximum Marks					
						University Exam			Practical Exam		
		L	T	P	Total	Internal	External	Total	Internal	External	Total
03DYMI101	MINE VENTILATION	2	-	-	2	30	70	100	-	-	-
03DYMI102	ROCK MECHANICS	3	-	-	3	30	70	100	-	-	-
03DYMI103	MINING HAZARDS & SAFETY	2	-	-	2	30	70	100	-	-	-
03DYMI104	MINING & PROCESSING OF DIMENSIONAL STONE	2	-	-	2	30	70	100	-	-	-
03DYMI105	MINE SURVEYING -II	2	-	-	2	30	70	100	-	-	-
03DYMI106	MINE MANAGEMENT SAFETY & LEGISLATION	2	-	-	2	30	70	100	-	-	-
03DYMI107	UNDER GROUND MINING OF COAL	3	-	-	3	30	70	100	-	-	-
03DYMI108	UNDER GROUND MATALIFFEROUS MINING	3	-	-	3	30	70	100	-	-	-
03DYMI109	MINING -II	3			3	30	70	100			
	PRACTICALS										
03DYMI201	PROJECT	-	-	2	2	-	-	-	50	50	100
03DYMI202	MINE VENTILATION LAB	-	-	2	2	-	-	-	50	-	50
03DYMI203	ROCK MECHANICS LAB	-	-	2	2	-	-	-	50	-	50
03DYMI204	MINING HAZARDS & SAFETY LAB	-	-	2	2	-	-	-	50	-	50
03DYMI205	MINING –II LAB	-		2	2				50	-	50
03DYMI206	PRACTICAL TRAINING	-	-	2	2	-	-	-	50	50	100

03DYMI301	DISCIPLINE & EXTRA-CURRICULAR ACTIVITIES	-		-	-	-	-	-	50	-	50
TOTAL		**24**	**-**	**12**	**36**	**300**	**700**	**1000**	**350**	**100**	**450**

GRAND TOTAL – 1450

02DYMI101 MINING -I

Unit-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.

Unit-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: Different types of detonators, advantage of delay detonators, Safety fuse, detonating fuse. Simultaneous and delay action firing.

2.4 Exploders: Different types, construction and safety features of exploders.

2.5 Blasting practice in mines: Shot-firing tools, Preparation of charge, Procedure for firing shots, Direct & Indirect initiation, stemming material, water ampules, cushion firing, Blasting efficiency, - consideration of factors, 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.

Unit-3 Shaft Sinking

3.1 Introduction Vertical stapling inclined shafts, Shapes & size of a shaft, Selection of site for shafts.

3.2 Sinking operation: Through normal/coal measures strata, Bore hole patterns of blasting, rock/ muck Disposal methods from underground & surface, Transport of men - material & rock/muck. Dealing with water during sinking, bucketing, pumping, etc, Providing ventilation in sinking shafts to remove explosive fumes & strata -gases.

3.3 Support of shaft sides: Support of shaft sides, Temporary and permanent lining, Scaffolding, etc.

3.4 Safety in shaft sinking:Safety aspects of shaft sinking.

3.5 Special methods of shaft sinking: Pilling, Drop shaft caission, Cementation, Freezing, etc.

3.6 Misellanious: Mechanised sinking, Sinking upwards, Widening & deepening of shafts, Shaft centering for vertical shafts, Directions & gradient maintenance of inclined shafts.

Unit-4 Drift Driving/Tunneling

4.1 Connecting different levels, Horizons, mineral bodies, Crossing fault, Dykes folds, washouts to establish continuity connections for purpose of transport, Traveling, Ventilation, etc., Blasting hole patters, Rock disposal transport, ventilation, pumping, etc.,During, Tunnelling.
4.2 Support of drift/Tunnels.
4.3 Safety aspects.
4.4 Mechanised tunneling.

Unit-5 Support of Roof, Sides & Floor Control in Mines

5.1 Properties of various types of roof, testing of roof, Materials used for support in mines, Classification of supports.
5.2 Seasoning of timber, preservation of timer, setting of prop Bars, cogsside support, fore polling, Roof bolts.
5.3 Support of roadway, roadway junction, Clearing up of heavy roof fall, ithdrawal of support.
5.4 Yielding type of support and Hydraulic supports
5.5 Roof bolting practice, Different types of rock bolts.
5.6 Face advancing supports.

REFERENCE BOOKS

1. Elements of Mining Technology — D.J. Deshmukh.
2. U/G metallifarous Mining Methods — Y. P. Chacherkar.
3. Introduction of Mining — Lewis & clark
4. Drilling Technology — Chugh
5. Elements of Mining — Arogyaswamy

02DYMI102 MINING MACHINERIES -I

Unit-1 Open-Cast Machineries

1.1 Drills-showels-draglines-Bucket Wheel Excavators, Their construction - & operations.

Unit-2 Transport - Machineries

2.1 Rope-haulages: Different types of haulages, construction, & Operations, (Direct, Endless)
2.2 Mine locomotives: Diesel, Electric, Battery, & trolley wire, compressed air,- their application - merits - demerits. Diesel locomotive Flame traps - & exhaust conditioner box.
2.3 Conveyors: Construction & application.Belt:- Their drives,loops take up arrangement, troughed belt, carrying capacity of conveyor.
2.4 Chain conveyors & shaker conveyors: Scrapper chain conveyorsarmoured flexible conveyors, their principle, operation construction & application - merits & demerits.

Unit-3 Mine Track & Safety Devices

3.1 Safety systems on haulage roads- including JAZZ rails, back catches.
3.2 Couplings: Different types of rope coupling, - clips tub couplings.
3.3 Crossing curves:- Haulage curves, goose neck curves Diamond crossing.
3.4 General: Description with simple sketches of haulage systems - Numerical problems of different types of rope haulage systems.

Unit-4 Mine Dewatering Machineries

4.1 Sources of water in mines.
4.2 Classification of mine pump.
4.3 Siphon.
4.4 Ram pump- construction -features - working & its use.
4.5 Centrifugal turbine pump constructional features,working & use. Balancing axial thrust, characteristic curves for turbine pumps.
4.6 Roto pump - construction features, working and use.
4.7 Sinking pump - constructional features, working, method of suspension in shaft use.
4.8 Bore hole pump - constructional features working installation and use.
4.9 Trouble in pumps & remedial measures.
4.10 Arrangement of pipes & pipe joints.
4.11 Support of rising main in shaft.
4.12 Pump calculations, numerical problems.
4.13 Main sump at pit bottom.

Unit-5 Underground Face Machinaries

5.1 Board & Pillar coal cutting machines
5.2 Coal drills.
5.3 Long wall machines

Unit-6 Mechanical Loaders

6.1 Rocker shovels
6.2 Gathering arm loader
6.3 Scrapper
6.4 Load haul and dump machines
6.5 Construction and application of shuttle car.

Unit-7 Hosting Machinaries

7.1 Constructional Details of head gear frame
7.2 Constructional features of winding drum, cage and skip, winder drives
7.3 Safety devices used in winding system
7.4 Single and multi rope friction winding-multilevel winding
7.5 Pit top and Pit bottom circuits

Unit-8 Wire Ropes

8.1 Manufacturing Process of Wire Ropes
8.2 Types of wire ropes
8.3 Calculation based on wire ropes
8.4 Care and maintenance of wire ropes
8.5 Rope capping
8.6 Rope splicing

REFERENCE BOOKS

1. Elements of Mining Technology D.J. Deshmukh
2. Mine Pumps and Haulages S.Ghatak

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02DYMI103 **MINING GEOLOGY -I**

Unit-1 General Geology

1.1. Introduction : What is Geology ? Branches of Geology, Importance of studying Geology for Mining Engineering students. Brief introduction of solar system.

1.2 Origin of the earth : Classification of theories into Rotational type & Tidal type, Early theories:- Nebular Hypothesis by kant, Laplace's corrections over kant's hypothesis Plenetesinal hypothesis by Moulton & chemberling. Gaseous Tidal hypothesis by Jeans & Jeffereys. Name some very recent theories & their proponents.

1.3 Age of the erth: From history & organic evoluation, From rate of sedimentation, From salinity of sea water, From rate of cooling, From radiometric dating .

1.4 Interior of the earth: Crust, Mantle, Core.

Unit-2 Physical Geology

2.1 Weathering: Physical & Chemical Weathering.

2.2 Soil profile,soile types,like Residual and Transported soil.

2.3 Introduction to work of wind, work of stream, work of sea & Glaciers.

2.4 Introduction to volcanoes & Earth quakes.

Unit-3 Primary Structure or Deposition Texture & Structures

Definition, classification into Major & Minor types, significance of studying all such primary features, Why they are called Top & Bottom? Description of different important primary features.

Unit-4 Attitude of Beds

Define-strike, Dip, angle of dip, & direction of dip, initial dip, True dip & apparent dip. Relation between strike & direction at Dip.

Unit-5 Secondary Structures

5.1 Folds-what are folds; origin, categories of folds, parts of folds, Nomenclature of different folds, description with three dimensional diagrame. Recognisation of folds in the field, on geological Map, Underground.

5.2 Joints:- What are joints, Definition of some important joints.

5.3 Faults:- What are faults, Distinction between joints & fault, origin, classification, Description of important faults with three dimensional figures.

5.4 Unconfirmity:- Different types of Unconfirmity-Definition with three dimensional sketches.

Unit-6 Secondary Structures

6.1 Folds-what are folds; origin, categories of folds, parts of folds, Nomenclature of different folds, description with three dimensional diagrame.Recognisation of folds in the field, on geological Map, Underground.

6.2 Joints:- What are joints, Definition of some important joints.

6.3 Faults:- What are faults, Distinction between joints & fault, origin, classification, Description of important faults with three dimensional figures.

6.4 Unconfirmity:- Different types of Unconfirmity-Definition with three dimensional sketches.

Unit-7 Crystallography & Mineralogy

7.1 Definition of crystal & Mineral

7.2 Classification of crystal systems & classification of Minerals (Preliminary knowledge)

7.3 Physical properties of Minerals

7.4 Description of important Rock forming & Economic Minerals in terms of their physical properties & chemical composition.

Unit-8 Petrology

8.1 What are igneous, sedimentary,Metamorphic rocks (General definition)

8.2 Mode of formation of Igneous rocks, classification of igneous rocks; Important forms of igneous rocks. Characteristic properties of igneous rocks, effect of igneous injections on sedimenary rocks like coalseams.

8.3 Mode of formation of sedimentary rocks,Different classes of sedimentary rocks,characteristic properties of sedimentary rocks.

8.4 Metamorphism & Metamorphic rocks : Characteristic properties of metamorphic rocks

8.5 Description of Important Igneous, sedimentary & metamorphic rocks (Megascopic studies only) their uses of & occurrence in India with particular reference to lignite, lime stone, Multi metal & other major minerals occurring in Gujarat & other major mineral deposits of India.

REFERENCE BOOKS

1. General & Engineering Geology — Parbin Singh
2. Engineering Geology — K. M. Banger
3 Engineering Geology — R. S. Khurmi
4. Rutley elements of Minerology — H. H. Read

02DYMI104 SURVEYING

Unit-1

Introduction and scales

Unit-2

Chain & tape survey

Unit-3

Compass survey

Unit-4

Leveling and Contouring

Unit-5

Plane table survey

Unit-6

Introduction to theodolite, types, its uses, least count, settings, permanent and temporary adjustments methods, errors, error resolving

REFERENCE BOOKS:

1. Plane and Geodetic survey (Vol. I)	David Clark
2. Surveying and levelling (Vol. I)	T.P.Kanetkar & S.V.Kulkarni
3. Surveying (Vol. I)	Dr. B.C.Punmia
4. Surveying and levelling	Hussain & Nagrani
5. Surveying	C.L.Kochher

02DYMI105 MINE SAMPLING ASSAYING AND MINERAL DRESSING

Unit-1 Mine Sampling

1.1 Definition, terms, purpose and various uses.
1.2 Different Sampling Methods.
1.3 Salting-purpose,safety against salting.
1.4 Reduction of sampling- Methods used

Unit-2 Assaying

2.1 Introduction - assaymap, assay plan factor, assay values, grade value, tenar, type of grade value.
2.2 Calculations based on average assay value.
2.3 Estimation of ore reserves.

Unit-3 Mineral Dressing

3.1 Scope, objectives & limitations of Mineral Dressing.
3.2 Comminution.
3.3 Size separation.
3.4 Gravity concentration methods.
3.5 Introductory froth floatation.
3.6 Simplified flow sheets of coal, copper, Lead & zinc, iron, limestones

Unit-4

Coal Beneficiations Methods (briefly)

REFERENCE BOOKS

1. Mineral dressing	Gaudin
2. Mine economics	Sinha & Sharma
3. Element of mining	D.J.Deshmukh
4. U.M.S.	
5. Mine economics	A.Kumar

02DYMI106 MINE SURVEYING-I

Unit-1 Triangulation

Introduction-principle-purpose, classification triangulation system-Reconnaissance selection of stations-station map signals well conditioned triangles - base of verification- base of expansions. Forms triangulation - Simple chain triangulation - Double triangles - Theodolites used for triangulation - Base line measurements - corrections,problems based on corrections.

Unit-2 Tacheomatric Survey

Principles of Tacheomatry - Difference between Theodolite and Tachometer.Tachometer - construction stadia rod - common method of Tacheomatry - stadia method Tangential method, angular Tacheomatry - Tacheometric constants. Numerical problems. Based on various methods - Field work Method of booking - Errors and precision, Auto reduction tachometer - calculations of volume, mineral stock pile - (by taping profile & Techeomatric survey)

Unit-3 Setting Out

3.1 Setting out a point of known rectangular coordinates, points for foundation, shaft surveys, selection and fixing of under ground stations, difficulties in underground curve laying, Introduction to U/g curves, numerical examples.
3.2 Giving and maintaining direction and gradient for inclined shafts, slopes, levels and tunnels, maintaining alignment.
3.3 Auxiliary Telescope-Top and side telescope surveying for open pits.

Unit-4 Underground Survey

4.1 Introduction, purpose,advantages of correlation surveys.
4.2 Description of methods used in correlation survey
4.3 Underground traversing and setting of new road ways
4.4 Stope surveying- purpose and advantages
4.5 Classification of stope surveying-Methods and instruments used

Unit-5 Astronomy Basic

5.1 Terms and definitions
5.2 Determination of true meridian
5.3 Latitude and longitude.

REFERENCE BOOKS

1. Surveying (Vol-I,II & III) Kanetakar
2. Mine surveying(Vol-I,II & III) S . Ghatak
3. U.M.S. I.S.M.,Dhanbad
4. Mine surveying Agor
5. Surveying Ponamiya

02DYMI107 **SURFACE MINING**

Unit-1 Surface Mining

Advantages & disadvantages of preliminary evaluations of surface mine project. Pit planning & Design, surface mining methods, choice of machine, systems- Coal/Lignite/Mineral O.B. Thickness ratio- stripping ratio.

Unit-2 Mine Development

Opening out - preparation of haulroads section of waste dumping sites etc

Unit-3 Drilling & Blasting

3.1 Explosives used in open cast mine. ANFO,SLURRY Explosive, LOX, Emulsion Explosives.
3.2 Formation of Benches, drilling principle, different types of blast hole drills, use of different types of Quarry- Explosives, secondary blasting, problems associated with drilling and blasting.

Unit-4 Excavation & Transportation

4.1 Principles of operation of single bucket & multibucket excavators.
4.2 Cyclic methods: Shovel-dumpers- pay loaders, drag lines, rippers, scrappers continuous methods.
4.3 Study of above machinery.
4.4 Conveyors: Stacker Reclaimer- Railway Ropeways,
4.5 Case studies & layout of dumper shovel combination.
4.6 Open pit slope stability , Ground water control utilities.
4.7 Organisation structures

Unit-5 Open Cast Mechanisation

Shovel mining, Dragline Mining, Dumpers, Crushers, Conveyors, Deep hole blasting.

REFERENCE BOOKS:

1. Elements of Mining Technology by D.J.Deshmukh
2. Surface Mining Technology by Samir kumar Das

02DYMI108 **MINING MACHINERY- II**

Unit-1 Underground Face Machinaries
1.1 Board & Pillar coal cutting machines
1.2 Coal drills.
1.3 Long wall machines

Unit-2 Mechanical Loaders
2.1 Rocker shovels
2.2 Gathering arm loader
2.3 Scrapper
2.4 Load haul and dump machines
2.5 Construction and application of shuttle car.

Unit-3 Hosting Machinaries
3.1 Constructional Details of head gear frame
3.2 Constructional features of winding drum, cage and skip, winder drives
3.3 Safety devices used in winding system
3.4 Single and multi rope friction winding-multilevel winding
3.5 Pit top and Pit bottom circuits

Unit-4 Wire Ropes
4.1 Manufacturing Process of Wire Ropes
4.2 Types of wire ropes
4.3 Calculation based on wire ropes
4.4 Care and maintenance of wire ropes
4.5 Rope capping
4.6 Rope splicing

REFERENCE BOOKS:
1. Elements of mining engg. , D.J.Deshmukh

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02DYMI109 MINING GEOLOGY- II

Unit-1 Stratigraphy

1.1 Physiographic Divisions of India, knowledge of standard Geological time scale including added columns of Indian Equivalent systems (Peninsular & Extra peninsular), the economic importance of Major Indian systems, Important events in Indian subcontinent recorded all through the Geological ages.

1.2 Definitions of Archean Dharwars, Tertiaries.

1.3 Archean / Dharwarian / Tertiary stratigraphy of: a) Gujarat b) Rajasthanc) Madhyapradesh d) Maharashtra.

1.4 Economic importance of Archean, Dharwarian, Tertiary rocks of India

1.5 Stratigraphy of the Gondwana group of rocks/ system, what are Gondwana rocks? why they are called a group of rocks rather than a system ? Their distribution in India, classification, Gondwana land, full succession of Gondwana Rocks (Table), Description of lower Gondwanas (with special reference to Eastern Indian coal Bearing stages), important plant fossils of lower Gondwanas.

1.6 Economic Importance of Gondwana rocks.

Unit-2 Economic Fuel Geology

A. Coal Geology

2.1 Definition of coal, Rank of coal, whether coal is " Rock or " Mineral, cyclic order of coal formation, pattern of deposition in the Damodar valley Area.

2.2 Origin of coal Insitu & drift theory with special reference to the origin of coal in the Indian subcontinent Name the places of occurrence of coal.

2.3 Formation of coal (Brief knowledge) Biochemical stage or Humification process & Geological stage or coalification process.

2.4 General knowledge of different coal / lignite fields of India.

B. Petroleum Geology

2.5 Properties and origin of petroleum

2.6 Trap formation

2.7 Introduction of important onshore and offshore oil field of india

2.8 Details of oil fields of the cambay-basin and other petrolium resources of Gujarat.

Unit-3 Oil Mining

3.1 Methods of Drilling.

3.2 Primary & secondry methods of oil production.

Unit-4 Ore Genesis

4.1 Definition of ore, ore mineral, Gangue mineral, Tanor of ore, Metallogenetic epochs & provines.

4.2 Process of ore formation Knowledge of all the processes of formation of different Mineral Deposits included under the following four occurrences classes (with special reference to Indian ifany): Igneous Mineral Deposits, Sedimentary Mineral Deposit, Metamorphic Mineral Deposit, Secondary Enriched Mineral Deposit.

Unit-5 Economic Geology

5.1 Knowledge of different ore minerals of Important Metals, Use of extracted metals, Rock association of import ant ore deposits.

Unit-6 Geological Mapping
6.1 Introduction to Topographic maps, Contour maps,
Geological maps and various land forms.
6.2 Brief knowledge of the recongnisation of the following structures on a geological maps.
- Horizontal, inclined, vertical beds.
- Folds, faults, unconformity and igneous injections.

Unit-7 Geology of Rajasthan
7.1 Major rock formations of Rajasthan.
7.2 Economic geology of Rajasthan with special reference to lignite, oil deposits, limestones & multimetal deposits.

02DYMI110 MINE ELECTRICAL ENGINEERING

Unit-1 Surface Sub-Station
1.1 Transmission lines from power company, their performances, Distribution on surface.
1.2 General surface substation for underground mine/quarries.

Unit-2 Underground Power Installation
2.1 Distribution of power in quarries and mines.
2.2 Underground distribution.
2.3 Sub-station planning.

Unit-3 Mining Switch Gears
3.1 Gate and box.
3.2 Pillar switch.
3.3 Drill panel.

Unit-4 Mining Cables
4.1 Types of cables.
4.2 Construction and applicability, safety features.

Unit-5 Earthing Practice
5.1 Type of earthing used in mines
5.2 Main features, applicability and construction**.**

Unit-6 Miscellaneous
6.1 Flame proof enclosure.
6.2 Intrinsic safety.
6.3 Haulage and shaft signaling.
6.4 Symmetrical faults and circuit breaker equipment, Calculations.
6.5 Principle of thyristors and their application to mines device.
6.6 Load factor, diversity factor, Principle of tariffs as applied to mines.

Unit-7 Indian Electricity Rules
7.1 Terms and definitions.
7.2 Voltage limits, etc.

REFERENCE BOOKS:

1. Mine Elect Engg , Dash
2. Indian Electricity Rules
3. Mine Electrical, Nil K Dutta

02DYMI201 MINING LAB

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.
11. Study and sketches of temporary lining during shaft sinking.
12. Study and sketches of permanent lining during shaft sinking.
13. Study of drilling & blasting pattern for shaft sinking.
14. Study of different types of special methods of shaft sinking.
15. Sketch and study of different types of blast hole patterns in drift drivage/tunnelling.
16. Study of hydraulic, friction, screw types props and chock release mechanisms.
17. Study of different ways of supporting road way junctions, Measonary, steel, etc.
18. Study of safary supports, Roof stietching etc.
19. Study of different types of face advancing supports

02DYMI202 MINING MACHINERIES-I LAB

1. Study of different types of rope haulages
2. Study of diesel locomotive flame traps & exhaust conditioner box
3. Study of different types of belt & chain conveyors
4. Study of loops takeup arrangement
5. Study & sketeches of various haulage track safety devices
6. Study of various types of rope couplings
7. Study of Ram pump
8. Study of Turbine pump
9. Study of Roto pump.
10. Study of Bore hole pump
11. Study of constructional feature & working of Coal Cutting machines.
12. Study of Coal Drill Construction working & Maintenance.
13. Study of Constructional features of Shearer.
14. Study of constructional features of Road headers.
15. Study and Sketch of Winding Drum.
16. Study and Sketch of Winding Engine Brakes.
17. Study of Safety Hooks.
18. Study of different types of Pit Top & Bottom Circuits for Cage windings.
19. Study of different types of wire ropes used in mine
20. Study of Splicing of Haulage Ropes.

02DYMI203 MINING GEOLOGY-I LAB

1. Study of Physical Properties of Minerals
2. Determining the Specific Gravity of Minerals by various methods
3. Megascopic studies of igneous Rocks with Tabular Classification
4. Megascopic studies of sedimentary Rocks with Tabular Clasification
5. Megascopic studies of Metamorphic Rocks
6. Study and Identification of important Rock forming Minerals in Hand Specimen
7. Study and Identification of important Economic Minerals in Hand Specimen
8. Study and Sketch of Model showing different types of Faults, Folds and their relations to photography
9. Study of Geological Time Scale.
10. Study of Stratigraphy and rock formation in Gujarat.
11. Study of Classification of Earth Materials, important Ore Minerals, some common Association of Minerals and Rocks with Ores.
12. Study pf Geographic, and Geological Classification of Economic Minerals & Rock in India.
13. Study and sketch of Brunton compass and clinometer.
14. Study of Topographical & Contour maps and Sections.
15. Study of various Land Forms.

02DYMI204 SURVEYING PRACTICES LAB

A. Practices and projects in the field for

1. Chain and tape survey
2. Chain and compass survey
3. Leveling survey
4. Plain table survey
5. Use of theodolite in traverse and tachemetry

B. For all Projects, there is compulsion in presence for Students

1. Filling of appropriate tables
2. Calculations,
3. Finding errors
4. Error resolving using
5. Graphical and
6. Analytical methods
7. Preparation of drawing
8. Presentation
9. Binding of all sheets

02DYMI205 MINE SAMPLING ASSAYING AND MINERAL DRESSING LAB

1. Study of sampling methods.
2. Study of constructional features of jaw crusher.
3. Study of different types of tumbling mills.
4. Study of froth floatation.
5. Study of Gravity concentration methods.
6. Study of magnetic separation.
7. Study of various flow sheets.

02DYMI206 MINE SURVEYING LAB

1. Tacheometric contouring-Sheet I
2. Tangential method & Techeometry-Practice.
3. Setting out of simple circular curves.(a) By linear method
4. Triangulation survey practice.
5. Setting out correlation method of survey by Co-planning method.
6. Setting out correlation method of survey by Wiess batch triangle method.
7. Setting out correlation method of survey by Wiess Quadrilateral method.
8. Study of Gyrotheodolite method
9. Theodolite traverse survey.
10. Method of co-ordinates.
11. Close traversing by Theodolite & balansing by Bowdith rule & transit rule.
12. Study of Miners Dial its constructional features & adjustments
13. Study of measurment of Depth of a vertical shaft.
14. Study of measuring subsidence.
15. Determine the true apparent dip & strike from bore hole data.

02DYMI207 SURFACE MINING LAB

1. Study of different types of explosives used in open cast mining.
2. Study & sketch of different types of drilling patterns used in O/C Mines.
3. Study of different methods of secondary blasting.
4. Study of Constructional features & Working methods of Bucket Wheel Excavator.
5. Study of hydraulic excavators & rope shovel.
6. Study of draglines.
7. Study of dumpers.
8. Study of stackers reclamers.
9. Study of Arial rope ways.

02DYMI208 MINING MACHINARY -II

1. Study of constructional feature & working of Coal Cutting machines.
2. Study of Coal Drill Construction working & Maintenance.
3. Study of Constructional features of Shearer.
4. Study of constructional features of Road headers.
5. Study and Sketch of Winding Drum.
6. Study and Sketch of Winding Engine Brakes.
7. Study of Safety Hooks.
8. Study of different types of Pit Top & Bottom Circuits for Cage windings.
9. Study of different types of wire ropes used in mine
10. Study of Splicing of Haulage Ropes

02DYMI209 MINING GEOLOGY-II LAB

1. Study of Physical Properties of Minerals
2. Determining the Specific Gravity of Minerals by various methods
3. Megascopic studies of igneous Rocks with Tabular Classification
4. Megascopic studies of sedimentary Rocks with Tabular Clasification
5. Megascopic studies of Metamorphic Rocks
6. Study and Identification of important Rock forming Minerals in Hand Specimen
7. Study and Identification of important Economic Minerals in Hand Specimen
8. Study and Sketch of Model showing different types of Faults, Folds and their relations to photography

03DYMI101 MINE VENTILATION

Unit-1 Mine Atmosphere

Mine atmosphere V/s surface atmosphere, Composition of the two, In brief, fresh surface air sent down the mine gets polluted, On account of various mining activities, Properties & Effects on human being, various mine gases Methane CO2, CO, H2S, SO2 Nitrous oxides, etc., Humidity & temperature.

1.1 Fire Damp: FIRE DAMP (Methane chiefly).Emission in U/G workings, Gradual oxidation, out bursts, blowers. How firedamp is locked up in coal mass, e.g. particle surface occlusion intermolecular spaces, cavities, pockets, etc. Methane layering in mine workings. Methane drainage from coal deposits and advance safety measures.

1.2 Detection of fire damp & other mine gases during inspections & precautions when detacted beyond safe levels

Unit-2 Mine Ventilation

2.1 Brief information about Natural ventilation of Mines.

2.2 Mechanical ventilation of mines. Main & auxilliary fan. Mine Ventilation By Fans Installed On Surface At Mine Heads: Types of fans, Exhaust & forcing systems of mine ventilations, Fan installation, fan drives, Evasee Chimney & fan houses air Lock at mine top, Instruments permanently installed in fan house for continuous monitoring of operation, Auxilliary underground, Ventilation for districts by booster fans & forlong heading drivages by portable/shiftable fans, Steel tubes, Canvass tubes, etc., advantages & disadvantages of auxilliary systems of ventilation, Neutral-line.

2.3 Fan characteristic curves, laws of fan ventilation, quantity pressure & H.P. relations, mine circuit resistance.2.4 ventilation surveys in mines**:** Quantity surveys pressure surveys, Instruments & Method used.

2.5 Simple numerical problems on mechanical/ fan ventilation Laws: Safety and statutory aspects of mine ventilation.

Unit-3 Mine Lighting

Problems of mine lighting by cap lamps, etc., Individual portable personnel lighting, General road way lighting, work stations lighting pitbottom loading points, etc., Flame proof lighting, Caplamp room, Layout, Organisation & operation, Maintenance, etc.

REFERENCE BOOKS

1. Element of Mining Technology vol 2 by D.J.Desmukh
2. Mine Ventilation by J B Mishra

03DYMI102 ROCK MACHANICS

Unit-1 Rock Mechanics
1.1 Physico-Mechanical properties of rocks & soil.
1.2 Different stresses & strains.
1.3 Engineering Classification of rock masses.
1.4 Failure Mechanics & theories.
1.5 Rock of structural features & discontinuities in failures.

Unit-2 Rock Pressure & Subsidence Due To Mining
2.1 Distribution of forces around narrow excavations.
2.2 Pressure Arch theory: Pressure arch in long wall workings.
2.3 Angle of draw, Subsidence factor: Critical area of extraction, Factors affecting subsidence & controlled subsidence.
2.4 Precautionary measures against damage due to subsidence :shaft pillar, Size of pillars in mine workings, Determination of their size, stability, of open pit slopes.
2.5 Subsidence survey plan & section.

Unit-3 Rock Excavation Engineering
3.1 Methods of assessing cuttability of rocks index tests and abrasivity, Determination of shear strength by (a)double shear methods (b)Punch Methods, Test hammers for in situ strengths.
3.2 Mechanics of rock breakage & fractures, Rock fragmentation by explosive action, Cutting zipping & impacts.
3.3 Rock cutting by rocks, discs & roller cutters water-jet cutting.
3.4 Principles of rock cutting machines, road-headers, TBMs, coal- face machines, & bucket-wheel excavators.
3.5 Rock cutting tool materials.

Unit-4 Rock Testing
4.1 Introduction
4.2 Sampling and Sample preparation
4.3 Specimen
4.4 Universal compressive strength test
4.5 Tensile strength
4.6 Flexural strength test?
4.7 Shear strength test

Unit-5 Rock Exploration
5.1 Introduction
5.2 Object of exploration
5.3 Methods of rock exploration
5.4 Rock exploration by direct penetration: Core boring, Core recovery, Rock quality designation, Fracture frequency
5.5 Large diameter calyx hole
5.6 Logging of core

Unit-6 Drifting / Tunneling
6.1 Operational system & use of machines.
6.2 Mechanics of rock cutting blasting
6.3 Vibration & damages criteria.
6.4 Application and Methods of drift driving

6.5 Size & shape of drivage
6.6 Hole pattern & depth for maximum pull current
6.7 Unseived problems and approach to solution

REFERENCE BOOKS:

1. Rock mechanics, B. P. Verma
2. The elements & Mechanics of Mining Ground (vol I & II) Dr, B. S. Verma.
3. Design Criteria for drill rigs equipments of drilling techniques, C. P. chugh
4. Ground control in Mining, S. K. Sarkar.

03DYMI103 MINING HAZARDS & SAFETY

Unit-1 Mine Fires

Spontaneous Heating, Different stages: Determination of proneness of coal by crossing point, Factors governing proneness to spontaneous combustion, Detection of spontaneous heating symptoms, Preventive measures, Including pannel system layout, Adequate ventilation provisions in design stages, Regular inspections etc.

Unit-2

(i)Fires: Underground & quarry fires: Causes of mine fires, Dealing with mine fires, Sealing off, different types of stopping, construction & purposes, Pressure balancing to control air leakage into sealed off fire-areas, Methods of collection of air samples from sealed off fire - areas and from mine atmosphere, Recovery of sealed off mine working on account of fire by reopening.

(ii) Dealing With Fires In Quarry: Debris, Coal pillars & coal stocks different types of fire extinguishers safety & statutory aspects.

Unit-3 Mine-Explosions

(i) Fire Damp Explosions: limits of inflammability & various factors influencing the same, Causes of fire damp explosions, Preventive measures.

(ii) Coal Dust Explosions Causes

Factors affecting inflammability of coal dust, Causes of & preventive measures against coal dust explosions, Various stone dust, Types & efficiency, Stone dusting, Stone dust barriers water barriers & triggered barriers, Organization for stone dust treatment of coal dust, Sampling procedures of roadways mine dusts apparatus & organization, Safety & statutory aspects.

Unit-4 Mine Inundation

Causes of inundation by surface & underground water both in opencast & underground mines.

Preventive Measures:

Boundary arriers, Panel barriers, Waterdams, Calculation of dam size & construction, Approaching water-logged workings, Precautions, Long - bore- hole patterns by burnside boring apparatus, Safety & statutory aspects.

Unit-5 Mine Rescue & Recovery Work

Search for survivers & their rescue, clearing dead bodies re-establishing systems connected with immediate rescue operation, What is Rescue & Recovery, Its scope, Rescue organisation at

coalfield & mine levels, Rescue stations, Rescue teams, Selection, Initial & refresher trainings, Rescue apparatus self contained portable breathing apparatus, Gasmasks, Smoke helmets, Self rescuers, Reviving apparatus, With actual rescue operations, Fresh air base & surface, Fresh, Air bases, Life lines & communication, Actual operations survival techniques use of bore holes in rescue operations.

REFERENCE BOOKS:

1. Elements of Mining Technology Vol-2, D. J. Deshmukh
2 Mine Disasters and Mine Rescue – M.A. Ramlu

03DYMI104 MINING & PROCESSING OF DIMENSIONAL STONE

Unit-1
Resources of Marble, Granite, Slate, Sandstone and Limestone as Dimensional stones in India, uses, marketing export. Geological, Mineralogical and physic mechanical properties of dimensional stones, Criteria for selection of dimensional stone deposit.

Unit-2 Mining
Convention mining of sandstone, Limestone, Marble and Granite, Wire saw, Chain saw, hydraulic splitting flam jet cutting, water channeling, etc., Blasting in dimensional stone mines, Development of mine, Mine layout, Block yield.

Unit-3 Processing
Dressing, Sawing, Gangs saw, Circular saws, Preparation and mounting of blade/discs and segments, Polishing Manual Mechanical, Various types of polishing machine.

Unit-4 Abrasive
Type, use and selection, shaping.

Unit-5
Tile preparation, Automatic tiling plant, Environmental impact of mining and processing of dimensional stones, Secondary use of quarried land and waste of the industry.

REFERENCES:
1. Dimensional Stone Technology- S.S.Rathod,G.S.Bhardwas,S.C.Jain
2. Gems & Jewelry, Hand Book.
3. Reports on Marble Mining.

03DYMI105 MINE SURVEYING -II

Unit-1 Miscellaneous
6.1 Map projection system
6.2 Correlation of mine survey to the National Grid
6.3 Gyrotheodolite
6.4 Principle photogrammetion and it's application in Mining
6.5 The role of the mine surveyor and his legal responsibilities
6.6 The provision and maintenance of statutory mine plans
6.7 Maintenance of survey instruments.

Unit-2 Theodolite-I
PARTS - Terms used - Temporary adjustments - Tachometers. Measurements - such as ranging, Establishing new station, horizontal angle, vertical angle, bearings, permanent adjustment.

Unit-3 Theodolite-II
Purpose of traversing first, second and third order traverse, closed closed and open traverse. Included and direct angles, Lati tude, Departures, checks-corrections of the traverse- Bowdith rule and transit rule.

Unit-4 Dial Survey
Miners dial- Dial and telescopic - Minersdial construction - temporary and permanent adjustment.Booking survey –Graphic Method. - Field & line Method.Setting out underground road ways with the help of dial,Plotting by protactor, Test for Minersdial, precautions to be taken. Methods used in dial surveying-Loose needle survey-Fast needle survey.

Unit-5 Dip Strike Problems
Determining the true and apparent dip and strike from bore hole data, Determining the deviation in the borehole drilling - Determining the throw of fault and length of drift to cross the fault, Finding out the bearings and dip of various mine working.

03DYMI106 MINE MANAGEMENT SAFETY AND LEGISLATION

Unit-1 Management
1.1 Basic concepts of Management and functions of Management, brief discussions on planning, organising, co-ordinating, Motivating, Directing, & Controlling.
1.2 Scientific management - main principles-advantages.
1.3 Personal Management - brief concept.
1.4 Management by objectives-meaning of the termessentials for success of MBO-advantages of MBO.
1.5 Work study-meaning of the term-Time & motion studybasic concepts-procedure -advantages.
1.6 Wages-Definition essentials of a good wage system, Meaning of the, terms:- Nominal wages, real wages, living Wage minimum wages, fair wages, fall back wages, etc – different method of wage payments, merits and Demerits of each system,wage boards - Meaning of the term, leadlift, Tub pushing etc.
1.7 Incentives-basic concepts.
1.8 Inventory - basic concepts - merits & demerits.
1.9 Trade Unions & their functions.
Unit-2 General Legislation
2.1 Main provisions of Industrial Disputes Act'56
2.2 Workmen's compensation Act '23
2.3 Payment of Wages Act '36
2.4 Minimum Wages Act ' 48

Unit-3 Mine Legislation
3.1 Concession: Mineral Concession Rule 1960, Minor Mineral Concession Rules.
3.2 Conservation & Development: Mineral Conservation and Development Act 1957, Mineral Conservation andDevelopment Rules 1988,Forest Conservation Act 1980.
3.3 Safety and Welfare: Main Provisions of Mine Act 1952, Provision of Regulation of Coal

Mines and Metalliferrous Mines Regulations-on methods of working, roof support, explosive, ventilation, shafts & outlets, plans / sections & machinery, Mines Rules Relating to Firstaid, Sanitation, Drinking water. Main provision of Mines Creches Rules 1966, Mines Vocational Training Rules 1966, Electricity Rules 1956 as applicable to mines. Indian Explosive Act 1884 and Rules 1983,Oil Mining Regulation (OMR).

Unit-4 Accident, Health And Safety

4.1 Classification and analysis of accidents in mines,their causes and remedial measures and cost of accidents.Importance of mine safety and good house-keeping, safety publicity, selection of important places for display of posters. Occupational diseases, their causes and preventive measures. Pit safety committee.

REFERENCES BOOKS:

1. Industrial Management O.P.Khanna
2. Mine Management V.N.Singh
3. Mine Legislation Rakesh & Prasad
4. Mine Act, Rules, Regulations. M.C.R.1960, M.C.V.R.1988,F.C.A. 1980, I.E.R.1956, I.E.A.1884, I.E.R.1983, O.M.R.

03DYMI107 UNDER GROUND MINING OF COAL

Unit-1 Characteristics Of Indian Coal And Coal Measures Rocks

1.1 Mining conditions in INDIAN coal fields. Raniganj, Bihar, Orissa,M.P. ,A.P Assam etc.
1.2 Methods of Mining with their merits & demerits.
1.3 Board & pillar single & multisection.
1.4 Longwall advancing & retreating.
1.5 Horizon Mining.

Unit-2 Board & Pillar Methods

2.1 Size of pillars, shape of pillars, square, rectangular etc.
2.2 Width of heading, height of headings.

Unit-3 Development Work

3.1 Layouts : Panel systems , advantages, size of panel.
3.2 Methods of driving Roadways' galleries, manual, mechanical with use of explosives, mechanical-without use of explo sives.
3.3 Use of explosive in underground coal production with safety precautions & statutory restrictions.
3.4 Ventilation of mine working procedure in gassy mines.
3.5 Coal & Material Transport.

Unit-4 Depillaring /Final Extraction of Coal

4.1 Seams in Board & pillar: Extraction Methods, subsidence, systematic control of subsidence and strata during pillar extraction.
4.2 Strata control Measures : by stowing Methods in single & multiple sections.
4.3 Local falls, premature collapse/ subsidence, Air Blasts on account of subsidence.

Unit-5 Longwall Method

5.1 Types of longwall**:** Methods Advancing longwall - Merits & demerits, Retreating longwall, Merits & demerits.
5.2 Longwall layouts: Length of face directions, face size,panel size, width, height of roadways, actual driving of roadways.
5.3 Panel formation – various road ways driving mechanized methods with or without use of explosives.
5.4 Longwall extractions traction cyclic & continuous Methods Mechanised Methods of extraction by coal ploughs, shearers etc. pan or snaking chain conveyors etc.
5.5 Ventilation of long wall faces. - Dust control.
5.6 Coal transportation of longwall productions.
5.7 Face support on longwall faces in advancing/retreating faces.

Unit-6 Stowing Organisation

6.1 Different types of stowing (names only) Hydraulics and showing, advantages & limitation, factors influencing adaption of stowing: **Stowing Organisation:** Sand gathering/ mining operation of river bed end. Methods manual, shovel, pontoon, pumping of sand slurry.
6.2 Transportation of sand: Manual loading of tubs/trucks/dumpers, Shovel loading of dumpers, Pile haulages, Railways, Aerial ropeways, Belt conveyors.
6.3 Surface sand bunkers.
6.4 Surface sand stowing operation. Mixing chambers, various devices for efficient hydraulic conveyance of sand, Layout of stowing pipes in shafts & roadways up to stowing faces.
6.5 Actual underground stowing operation.
6.6 Rates of stowing in tones/hours, pipe jamming, pipe-wears, Maintenance of stowing

installation.
6.7 Safety aspect of stowing.

REFERENCES BOOKS:

1. Elements of mining D.J.Deshmukh
2. U.M.S.
3. Advanced coal Mining B.Singh.
4. Advance coal Mining Tech. Samir Kumar Das.

03DYMI108 UNDER GROUND METALIFFEROUS MINING

Unit-1 Introduction to Metaliferrous Mine Working

1.1 Scope & limitations of underground mining.

1.2 Choice of mode of Entries of underground deposits Adits, Shafts, inclines, combined modes & their applicability number & disposition.

1.3 Choice of level interval / back length, shaft station & pocket orebins, waste bins etc.

Unit-2 Mine Development

2.1 Driving of raises & winzes: Alimake raise climber in cycle of operation, Drop raising using large diameter drill holes, Raise borers, Winzes and pit bottom station method of slope preparation, Open raising method, Compartment method of raising.

2.2 Drivage of compainion level, cross-cut, drift their size shape and position.

Unit-3 Method of Working

3.1 Selection of stopping methods.

3.2 Classification of stopping methods.

3.3 Various methods of stopping: Underhand, overhand method, Breast stopping method, Shrinkage stopping method, Cut and fill stopping methods, Block caving method, Vertical creater method, Square set stopping method, Sub level stopping method

REFERENCES BOOKS:

1. Elements of mining (Vol-3) D.J.Deshmukh
2. U.S.M.
3. Metalliferous mining methods Y.P.Checharkar
4. Introduction to Mining Hartman
5. Surface Mining G.B.Mishra

03DYMI109 MINING - II

Unit-1 Shaft Sinking

1.1 Introduction Vertical stapling inclined shafts, Shapes & size of a shaft, Selection of site for shafts.

1.2 Sinking operation: Through normal/coal measures strata,Bore hole patterns of blasting, rock/ muck Disposal methods from underground & surface,Transport of men - material & rock/muck. Dealing with water during sinking, bucketing, pumping, etc, Providing ventilation in sinking shafts to remove explosive fumes & strata - gases.

1.3 Support of shaft sides: Support of shaft sides, Temporary and permanent lining, Scaffolding,etc.

1.4 Safety in shaft sinking: Safety aspects of shaft sinking.

1.5 Special methods of shaft sinking: Pilling, Drop shaft caission, Cementation, Freezing, etc.

1.6 Misellanious: Mechanised sinking, Sinking upwards, Widening & deepening of shafts, Shaft centering for vertical shafts, Directions & gradient maintenance of inclined shafts.

Unit-2 Drift Driving/Tunneling

2.1 Connecting different levels, Horizons, mineral bodies, Crossing fault, Dykes folds, washouts to establish continuity connections for purpose of transport, Traveling, Ventilation, etc., Blasting hole patters, Rock disposal transport, ventilation, pumping, etc.,During, Tunnelling.

2.2 Support of drift/Tunnels.

2.3 Safety aspects.

2.4 Mechanised tunneling.

Unit-3 Support of Roof, Sides & Floor Control in Mines

3.1 Properties of various types of roof, testing of roof, Materials used for support in mines, Classification of supports.

3.2 Seasoning of timber, preservation of timer, setting of prop Bars, cogs, side support, fore polling, Roof bolts.

3.3 Support of roadway, roadway junction, Clearing up of heavy roof fall, Withdrawal of support.

3.4 Yielding type of support and Hydraulic supports

3.5 Roof bolting practice, Different types of rock bolts.

3.6 Face advancing supports.

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REFERENCE BOOKS:

1. Elements of Mining Technology, D.J. Deshmukh.
2. U/G metallifarous Mining Methods, Y. P. Chacherkar.
3. U.M.S.

03DYMI201 PROJECT

Students in different group have to identify the problems related to the industries Problems related to mine planning will be selected during the course work at the start of the term under the supervision of Project Guide, students will be sent to various mining organizations to collect the data & specifications of machineries From the mine. Some models/charts related to methods of working, Operation of machineries shall also be prepared at institutional level. The students will submit the report. One week will be given for report preparation. The report will be prepared on hard and soft copies. A power point presentation of report should be done during seminar. Technical and new subject should be considered for the projects. Each group of students should be given two to three choices to select the project topic of their interest. Proper guideline and input should be given by the project guide.

03DYMI202 MINE VENTILATION LAB

1. Determination of relative humadity by whirling hygrometer
2. Study of self constaint breathing apparaqtus Proto Mark IV
3. Study and layout of Cap Lamp Room
4. Determination of Cooling Power of the mine air by using Kata thermometer
5. Measurement of air velocity quanity and pressure in a duct by using a Pitot Tube
6. Stuudy and sketch of air crossing ,regulator, Ventilating door air lock at pit top etc.
7. Study of different types of flame safety lamp and their use for determining CH_4 % in a Gassy Mine
8. Mine gas analysis by (a) Heldon's Apparatus (b) Orcet's apparatus
9. Determination of CO gas in mine working

03DYMI203 ROCK MECHANICS LAB

1. To determine the Impact strength Index of coad.
2. To determine the PROTODYKONOV Strength Index (PSI) of given, specimen.
3. To Determine the TRI. AXIAL compressive strength of rock specimen
4. Study of Rock Quality Designation.
5. To determine the uniaxial compressive strength of a given specimen

6. To determine the Shear strength of the given specimen by punch shear
7. Determination of shear strength by shear box method
8. Determination of In-situ compressive stresses by Flate Jack test
9. Determination of Tensile strength of a rock sample by direct Method.
10. Determination of Tensile Strength of a rock specimen by Brazilian Method.

03DYMI204 MINING HAZARDS & SAFETY LAB

1 Study of constructional features & working of self contained breathing apparatus.
2 Study of various types of Fire Extinguishers used in Mines.
3 Study of constructional features & working of self Rescuer.
4 Study of constructional features & working of Gas Mask.
5 Study of constructional features & working of Reviving apparatus.
6 Study of working of Burn Side Safety Boring Machine.
7 Study of constructional features & working of Stone Dust Barriers.

03DYMI205 MINING LAB -II

1. Study and sketches of temporary lining during shaft sinking.
2. Study and sketches of permanent lining during shaft sinking.
3. Study of drilling & blasting pattern for shaft sinking.
4. Study of different types of special methods of shaft sinking.
5. Sketch and study of different types of blast hole patterns in drift drivage/tunnelling.
6. Study of hydraulic, friction, screw types props and chock release mechanisms.
7. Study of different ways of supporting road way junctions, Measonary, steel, etc.
8. Study of safary supports, Roof stietching etc.
9. Study of different types of face advancing supports

03DYMI206 PRACTICAL TRAINING & INDUSTRIAL VISIT SEMINAR

A power point presentation of report submitted as Project should be done during seminar. Technical and new subject should be considered for the projects.

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