

RGPV (DIPLOMA WING) BHOPAL		OBE CURRICULUM FOR THE COURSE		FORMAT-3		Sheet No. 1/3	
Branch	Mining and Mine surveying			Semester		6	
Course Code	Course Name			SURFACE MINING TECHNOLOGY			
Course Outcome 1	To learn the basics and operations involved in the opencast mining.			Teach Hrs	Marks		
				20	14		
Learning Outcome 1	To understand classification of surface mining & its various terms.						
Contents	<p>Classification of surface mining methods, classification based on mechanization. Factors affecting choice of opencast mining methods, Stripping ratio: Maximum allowable stripping ratio, overall stripping ratio, Break even stripping ratio. Advantages and disadvantages of opencast mining. Elements of Benches: Height, width, angle of slope, toe, crest, statutory provisions regarding height, width, angle of slope etc.</p>						
Method of Assessment	External : End semester theory exam-Pen paper test						
Learning Outcome 2	To learn various operations involved for opening up of deposit in surface mining.						
Contents	<p>Unit operations involved, site preparation, Box cut, entry system in opencast mines. Opencast mine layout, factor determining choices of layout, overburden excavation, Disposal of overburden, overcasting etc, sample layouts for lime stone, copper, coal , iron ore deposits, method of work, machines required , manpower, OMS etc.</p>						
Method of Assessment	Internal: mid semester exam/assignment/quiz						
Course Outcome 2	To learn the various operations of opencast machineries.			Teach Hrs	Marks		
				20	14		
Learning Outcome 1	<i>To understand applicability, merits & demerits of various opencast mining machinery.</i>						
Contents	<p>Classification of Excavating equipments, selection, choices of opencast mining machinery. Excavators shovel, Rope shovel, hydraulic shovel, application, advantages, disadvantages, comparison Rope shovel and hydraulic shovel, operating parameter, output of a shovel. Various attachments to shovel. Specifications. Back hoe, operating parameter, application Dragline, operating parameters, applicability, working, advantages, disadvantages, comparison with shovel. Specifications.</p>						

Method of Assessment	External : End semester theory exam-Pen paper test		
Learning Outcome 2	To understand applicability, merits & demerits of bucket wheel excavators & surface miner.		
Contents	<ul style="list-style-type: none"> • Bucket wheel excavators. • Application, advantages & disadvantages, operation, working methods by Bucket wheel excavator, terrace cut, Dropping cut etc. <ul style="list-style-type: none"> ○ Rippers. Scrappers, bulldozer etc. ○ Surface miner its application, working. In pit crushing system • Precautionary measures while use of HEMM • Applications of GPS in opencast mining 		
Method of Assessment	External : End semester theory exam-Pen paper test		
Learning Outcome 3	To understand open cast layout design & necessity of HEMM.		
Contents	<ol style="list-style-type: none"> 1. Study of the layout of some important open cast mines in India. 2. Design of an open cast mine for a given output and other specified parameters. 3. Sketch & describe O/C Machinerries with their important units. 		
Method of Assessment	Internal: Task/ Experiment performance in Laboratory		
		Teach Hrs	Marks
Course Outcome 3	To Select suitable explosive for deep hole blasting in large opencast mines	20	14
Learning Outcome 1	To learn about various explosives used in OCM.		
Contents	Explosives used in opencast mine, ANFO, slurry explosive, emulsion explosives, Heavy ANFO explosive, LOX, their properties, composition etc. Boosters.		

Method of Assessment	External : End semester theory exam-Pen paper test		
Learning Outcome 2	To understand various initiation system used in blasting.		
Contents	Initiation system, non electric initiation system, Raydets, Nonel, excel shock tubes, electronic detonators, etc. Bulk explosive system, site mixed slurry, site mixed Emulsion, Bulk-loading system. Advantages, comparison. ANFO precautions while mixing, handling and use, Conditions for using bulk explosives.		
Method of Assessment	External : End semester theory exam-Pen paper test		
Learning Outcome 3	To learn various drilling system in ocm.		
Contents	Classification of the drill holes, based on depth, diameter and Pattern. Applications of vertical and inclined drilling. Merits and demerits of vertical and inclined drilling. Different parameters connected to drilling of blast holes. Patterns of drill holes employed		
Method of Assessment	Internal: mid semester exam/assignment/quiz		
Course Outcome 4	To Supervise/carryout blasting operation to give the optimum results from the blast.	Teach Hrs	Marks
		20	14
Learning Outcome 1	To understand the various bench blasting terminology.		

Contents	Bench blasting terminology, Blast hole geometry, hole depth, burden, spacing, sub grade drilling, bottom charge, column charge, stemming height.. Factors to be considered while blast designing. Simple numerical on blast design for the bench of surfaces mine.		
Method of Assessment	External : End semester theory exam-Pen paper test		
Learning Outcome 2	To understand various blasting technique in ocm.		
Contents	Single and multiple rows blasting their comparison, Sequence of blasting in single & multiple row. Precautions while charging and firing of holes in deep hole blasting, deck charging, muffled blasting, control blasting techniques, secondary blasting/breaking in opencast mines. Transport of Explosives in bulk, precautions while drilling and blasting of deep holes.		
Method of Assessment	External: End semester theory exam-Pen paper test.		
Course Outcome 5	To take proper care of environmental aspects, which may get affected due to blasting and other opencast mining activity?	Teach Hrs	Marks
		20	14
Learning Outcome 1	To know the various environmental aspects of open cast mining.		
Contents	Environmental aspects of opencast mining Fly rock, ground vibration, air blast their causes & prevention. Noise pollution, water pollution, Degradation of land, land reclamation. Salient features of environment protection Act, EMP and Environment impact assessment. Slope stability: Causes of un stability, forms of failure preventive measures.		
Method of Assessment	External : End semester theory exam-Pen paper test		

Learning Outcome 2	To understand the process of mineral transportation & land reclamation.
Contents	<ol style="list-style-type: none"> 1. Preparation of a plan for transportation of mineral from mine to beneficiation plant. 2. Study of land reclamation case of some important Indian mines.
Method of Assessment	Internal: Task/ Experiment performance in Laboratory

LIST OF EXPERIMENTS

Name of Experiment
<ol style="list-style-type: none"> 1. Study of the layout of some important open cast mines in India. 2. Design of an open cast mine for a given out put and other specified parameters. 3. Study of Blasting pattern. 4. Sketch & describe O/C Machineries with their important units. 5. Preparation of a plan for transportation of mineral from mine to beneficiation plant. 6. Study of land reclamation case of some important Indian mines. mine

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Branch	Mining and Mine surveying		Semester	6
Course Code	Course Name	Mine Environment Rescue & Recovery		

		Teach Hrs	Marks
Course Outcome 1	To take precautionary measures against mine fires.	20	14
Learning Outcome 1	To learn various causes and preventions of mine fire.		
Contents	<p>Factors responsible for mine fire.</p> <p>Causes of mine fire.</p> <p>Accidental fire, spontaneous heating; factors responsible for spontaneous heating.</p> <p>Incubation period, crossing point, ignition point.</p> <p>Precautions against spontaneous heating.</p> <p>Preventive measures against mine fires.</p>		
Method of Assessment	External : End semester theory exam-Pen paper test		
Learning Outcome 2	To understand application of fire extinguishers and recovery of sealed of area.		
Contents	<p>Classification of fire and various types of fire extinguishers.</p> <p>Fire stopping-purpose, constructional details</p> <p>Opening of a sealed of Area.</p> <p>Sampling from sealed off area</p>		
Method of Assessment	Internal: mid semester exam/assignment/quiz.		
Course Outcome 2	To take precautionary measures against mine explosions.	Teach Hrs 20	Marks 14

Learning Outcome 1	To understand mechanism and prevention of fire damp explosion.		
Contents	<p>FIRE DAMP EXPLOSION Introduction, Composition of firedamp Modes of emission of Firedamp, Degree of gassiness, methane layering. Mechanism of fire damp explosion, Flammability of firedamp, lower and upper limit of explosibility of firedamp, coward diagram factors governing limits of flammability, lag on ignition. Explosive limits of other flammable gases. Causes of fire damp explosion and its prevention. Characteristic of firedamp explosion. Study of some important gas explosions in Indian coal mines</p>		
Method of Assessment	External : End semester theory exam-Pen paper test		
Learning Outcome 2	To understand mechanism and prevention of fire damp explosion.		
Contents	<p>Mechanism of Coal Dust explosion, Flammability limits of coal dust, factors governing explosibility of coal dust, Characteristics of coal dust explosion. Causes of coal dust explosion. Prevention of coal dust explosion. Generalized stone dusting, Quantity of stone dust, Types and properties of stone dust, stone dusting plan. Stone dust barriers, types of stone dust barriers, specifications and construction, location of primary and secondary types of barriers. Situations under which barrier may fail, maintenance and care of stone dust barriers. Water barrier</p>		
Method of Assessment	External : End semester theory exam-Pen paper test		
Learning Outcome 3	To learn prevention of fire damp and coal dust explosion.		
Contents	<ol style="list-style-type: none"> 1. To sketch and describe different types of fire extinguishers. 2. To study the procedure of reopening of sealed off area. 3. To study the sampling of sealed off area. 4. To sketch and describe various types of fire stopping with fittings. 5. To sketch and describe various types of stone dust barrier. 		
Method of Assessment	Internal: Task/ Quiz/Assignment ,Experiment performance in Laboratory		
Course Outcome 3	To take precautionary measures against water inundation.	Teach Hrs	Marks
		20	14

Learning Outcome 1	To learn about sources and prevention of water inundation in mines.		
Contents	<p>Surface and underground causes of Inundation and its prevention. water dams, bulkhead doors. Precaution while approaching old water logged areas. Dewatering, burn side safety boring apparatus. Dams-purpose; site of dam; types of dams & their constructional details. Study of some important inundation causes in Indian mines. Additional precautions in rainy season in the mines located near by the rivers.</p>		
Method of Assessment	External : End semester theory exam-Pen paper test		
Learning Outcome 2	To learn about construction of various types of water dams.		
Contents	<ol style="list-style-type: none"> 1. To sketch and describe burn side boring apparatus. 2. To sketch and describe various types of water dams. 3. To sketch and describe emergency dam. 		
Method of Assessment	Internal: Task/ Experiment performance in Laboratory		
		Teach Hrs	Marks
Course Outcome 4	To learn about rescue operation and various rescue apparatus.	20	14
Learning Outcome 1	To understand utility and working operation of various rescue apparatus.		
Contents	<p>Introduction, classification of mine rescues apparatus, modern self contained breathing apparatus BG 174, its construction, application and scope. Common tests of self contained compressed oxygen breathing apparatus. Chemical oxygen self-rescuers, gas mask, filter self-rescuers: their construction, application and limitations. Fresh air hose type breathing apparatus. Fresh air base: location, personnel & equipments required. Layout of FAB. Resuscitation, Modern reviving apparatus.</p>		

Method of Assessment	External : End semester theory exam-Pen paper test
Learning Outcome 2	To learn about the importance of rescue organization and mine rescue rule.
Contents	Rescue stations-equipments used in rescue station, rescue organization, and its working, training of officials Mine Rescue rule 1985
Method of Assessment	Internal: mid semester exam/assignment/quiz
Learning Outcome 3	To understand various features of mine rescue work and rescue apparatus.
Contents	<ol style="list-style-type: none"> 1. To sketch and describe self rescuer. 2. To sketch and describe various types of self contained breathing apparatus. 3. To sketch and describe reviving apparatus (closed and open). 4. To draw the layout of rescue station. 5. To draw the layout and show the details of fresh air base.
Method of Assessment	Internal: Task/ Experiment performance in Laboratory

		Teach Hrs	Marks
Course Outcome 5	To know the sources of pollution due to mining operations and their prevention.	20	14
Learning Outcome 1	To understand the sources and harmful effects of pollution due to mining.		

<p>Contents</p>	<p style="text-align: center;">POLLUTION CONTROL</p> <p>Various types of pollution due to mining operations. Sources and harmful effects of pollution (Air, water, noise, dust, deforestation, spoiling of surface land etc.) Preventive measures. Introduction to pollution control Board</p>
<p>Method of Assessment</p>	<p>External : End semester theory exam-Pen paper test</p>

LIST OF EXPERIMENTS

Name of Experiment
1. To sketch and describe different types of fire extinguishers.
2. To study the procedure of reopening of sealed off area.
3. To study the sampling of sealed off area.
4. To sketch and describe various types of fire stopping with fittings.
5. To sketch and describe various types of stone dust barrier.
6. To sketch and describe burn side boring apparatus.
7. To sketch and describe various types of water dams.
8. To sketch and describe emergency dam.
9. To sketch and describe self rescuer.
10. To sketch and describe various types of self contained breathing apparatus.
11. To sketch and describe reviving apparatus (closed and open).
12. To draw the layout of rescue station.
13. To draw the layout and show the details of fresh air base.



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Branch	Mining and Mine surveying			Semester		6	
Course Code		Course Name		Mine Economics & Mineral Processing			
						Teach Hrs	Marks
Course Outcome 1	To understand the general economic terms.			20		14	
Learning Outcome 1	To learn some basic economic terms						
Contents	<p>GENERAL ECONOMICS</p> <p>i) Economic Terms - Wealth, Value, Goods, Price, ii) Wants-wants and economic activities, classification of wants. a. Law of diminishing utility. b. Law of equi-marginal utility iii) Utility-meaning, measurement, marginal and total Utility. iv) Demand- Definition, demand Schedule and demand curve. Law of demand curve. Extension and contraction in demand. Increase and decrease in demand. Elasticity of demand. v) Supply- Supply price, Supply Schedule, Supply curve, Supply function, Law of supply, Elasticity of supply. vi) Capital- Definition, Characteristics of capital. Importance and function of capital vii) Money- Definition of money, Function of money, Classification of money</p>						
Method of Assessment	External : End semester theory exam-Pen paper test						
						Teach Hrs	Marks
Course Outcome 2	To know the mineral policies regarding mineral industry.			20		14	
Learning Outcome 1	To understand the mineral industry, conservation of minerals and constitution of companies.						
Contents	<p>MINE ECONOMICS i) Mineral Industry-Its role in national economy. a. Indian Mineral resources and their statistics. b. Mineral Policies. c. Conservation of minerals including Coal Company. ii)Constitution of companies under companies Act. a. Types of companies. b. Private and public sectors, merits and demerits. (a) Govt. Undertakings. iii) Labour - Efficiency of labour. a. Labour welfare. b. Social securities. c. Trade Unions.</p>						
Method of Assessment	External : End semester theory exam-Pen paper test						
Course Outcome 3	To know the various methods of sampling.					Teach Hrs	Marks

		20	14
Learning Outcome 1	To understand procedure of sampling and their precautionary measures.		
Contents	SAMPLING 2.1 Principles of Sampling, Methods, Error, Selection of Sampling procedure for Particular deposits. Preparation of sample, Coning and Quarter Splitting methods of reduction of samples. SALTING 3.1 Salting method of salting, Salting methods by mistakes/errors. Purposeful salting procedures, Safe procedures for collecting sample to guard against purposeful salting. 3.2 Average stoping width, willing width of mining, clear width, Average width, Simple average, Weightage average, Mean values, Mining grade of ore, economical grade, cut off grade of ores, cut off grades of samples and stops.		
Method of Assessment	External : End semester theory exam-Pen paper test		
Course Outcome 4	To study valuation and depreciation of mine assets.	Teach Hrs	marks
		20	14
Learning Outcome 1	To understand the various methods of depreciation.		
Contents	VALUATION & DEPRECIATION 4.1 Valuation methods of valuation by different methods of annuity. Calculation of different annuities. 4.2 Methods of depreciation and calculation Of Depreciation methods of calculations of Redemption values. 4.3 Main valuation methods of mining Property which under production. Valuation under different methods. Report Of valuation of small mining property		
Method of Assessment	External : End semester theory exam-Pen paper test		
Course Outcome 5	To know the various operations of mineral beneficiation methods.	Teach Hrs	marks
		20	14
Learning Outcome 1	To understand various methods of ore dressing.		

Contents	<ul style="list-style-type: none"> ○ ORE DRESSING 5.1 Ore dressing, important methods of ore Dressing, their classification and their role in Mining Industry. 5.2 Preparation of ore for ore dressing, crusher, cone crusher, their construction working limit, size, grading of ore, introduction to (a) Tabling (b) Spanning (c) Gravity (d) Separation (e) Magnetic separation, (f) Floatation cell
Method of Assessment	External : End semester theory exam-Pen paper test