


Discipline: Drilling Engineering	Semester: 4TH semester	Name of the Teaching Faculty: Er. Brushabhanu Sahoo	
Subject(Theory): UNDERGROUND DRILLING Subject Code: TH2	No. of Periods /week : 04	Session: Summer 2023 No of weeks: 15 Semester from date-14.02.2023 to date-23.05.2023	
Week	Class Day	Theory Topics	Remarks
1 st	1 st	Basic concepts and definition of Underground drilling, Blast hole drilling, Shot holes, Primer, Easer and Trimmer.	
	2 nd	Basic concepts and definition of Underground drilling, Blast hole drilling, Shot holes, Primer, Easer and Trimmer.	
	3 rd	Blasting and drilling patterns in stone drifts. Various drilling patterns for underground coal mines with sketch.	
	4 th	Various drilling patterns for underground coal mines with sketch.	
2 nd	1 st	Various drilling patterns for underground coal mines with sketch.	
	2 nd	Explanation about an underground mine with steeply inclined ore body with sketch.	
	3 rd	Define and explain the terms used in underground mines like Incline, Drift, Stope, Raise, Shaft and Tunnel in a coal mine.	
	4 th	Define and explain the terms used in underground mines like Incline, Drift, Stope, Raise, Shaft and Tunnel in a coal mine.	
3 rd	1 st	Explain various sources of power supply to coal drills for underground coal mines.	
	2 nd	Compare various sources of power supply to coal drills for underground coal mines.	
	3 rd	Comparison between air leg drill and electric drill.	
	4 th	Comparison between air leg drill and electric drill.	
4 th	1 st	Define rock drills. State the drills used in underground metal mines.	
	2 nd	Explain hand held drills, powered rock drills and mobile crawler mounted drill.	
	3 rd	Comparison of various drills used in underground metal mines.	
	4 th	List out the drill bits used in underground metal drilling.	
5 th	1 st	Describe the mechanism and working principle of rock drills.	
	2 nd	Describe the mechanism and working principle of electric rotary drill machine for coal and stone.	
	3 rd	Describe the mechanism and working principle of rotary drill machine for coal and soft stone.	
	4 th	Procedure for commissioning of a portable drill in underground.	
6 th	1 st	Explain various drilling and blasting patterns for underground metal mines.	
	2 nd	Explain various drilling and blasting patterns for underground metal mines.	
	3 rd	Explain various drilling and blasting patterns for underground metal mines.	
	4 th	Explain various drilling and blasting patterns for underground metal mines.	


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7 th	1 st	Define and explain Rock bolting.	
	2 nd	Function of rock bolts. Tools and equipments required for underground rock bolting.	
	3 rd	Advantages and disadvantages of rock bolting.	
	4 th	Advance bolting, Side bolting and application of rock bolting.	
8 th	1 st	Explain different types of rock bolts and their application.	
	2 nd	Explain the procedure of rock bolting.	
	3 rd	Define and explain Roof stitching. Calculation for length of wire required for roof stitching.	
	4 th	Tools and equipments required for underground roof stitching.	
9 th	1 st	Explain the procedure of roof stitching.	
	2 nd	Explain upward drivage.	
	3 rd	Explain the method of raise boring.	
	4 th	Alimak raise climber.	
10 th	1 st	Difference between upward, vertical, inclined and horizontal drilling.	
	2 nd	Waterlogged areas in underground mines.	
	3 rd	Working principle of burn side safety boring apparatus and its application.	
	4 th	State and explain methane drainage drilling.	
11 th	1 st	Horizontal drilling procedure of boring for methane drainage.	
	2 nd	Directional drilling procedure of boring for methane drainage.	
	3 rd	Core and Dewatering holes.	
	4 th	Core and Dewatering holes.	
12 th	1 st	Different types of mounting and derrick.	
	2 nd	Explain the erection of derrick in underground.	
	3 rd	Define drilling fluid, flushing medium, annular space and circulation.	
	4 th	Describe various types of drilling fluid.	
13 th	1 st	Describe various types of drilling fluid.	
	2 nd	Describe various types of drilling fluid.	
	3 rd	Methods of development of drilling in underground.	
	4 th	Methods of development of drilling in underground.	
14 th	1 st	Methods of development of drilling in underground.	
	2 nd	Methods of development of drilling in underground.	
	3 rd	Procedure of locating bore hole points.	
	4 th	Procedure of locating bore hole points.	
15 th	1 st	Various safety precautions to be observed for underground drilling operations.	
	2 nd	Various safety precautions to be observed for underground drilling operations.	
	3 rd	General Rig safety rules.	
	4 th	General Rig safety rules.	

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