

JHARSUGUDA ENGINEERING SCHOOL, JHARSUGUDA
TH.4 UTILIZATION OF ELECTRICAL ENERGY & TRACTION
BY
SOURAV KUMAR MISHRA
LESSON PLAN
SESSION-2022-23

Sl.No.	Chapter	Hours	WEEK	Lecture No.	Topic to be covered
1	Chapter-1	8	ELECTROLYTIC PROCESS		
			1	1	Definition and Basic principle of Electro Deposition .
				1	Important terms regarding electrolysis. Faradays Laws of Electrolysis.
				1	Definitions of current efficiency, Energy efficiency.
				1	Principle of Electro Deposition.
			2	4	Factors affecting the amount of Electro Deposition. Factors governing the electro deposition. Discussing example of extraction of metals. Application of Electrolysis.
2	Chapter-2	8	ELECTRICAL HEATING		
			3	1	Introduction of electrical heating and its advantages.
				1	Mode of heat transfer and Stephen's Law.
				1	Discussing Principle of Resistance heating.
				1	working principle of direct arc furnace and indirect arc furnace.
			4	1	Working principle of direct core type, vertical core type and indirect core type Induction furnace.
				1	Principle of coreless induction furnace and skin effect.
				1	Principle of dielectric heating and its application.
			1	1	Principle of Microwave heating and its application.
			3	Chapter-3	8
5	1	Explain principle of arc welding.			
	1	Discuss D. C. Arc phenomena.			
	1	Discuss A. C. Arc phenomena.			
	1	D.C.. arc welding plants of single and multi-operation type			
6	1	A. C. arc welding plants of single and multi-operation type			
	1	Types of arc welding.			
	1	Explain principles of resistance welding			
	1	study of different resistance welding methods.			

4	Chapter-4	12	ILLUMINATION				
			7	1	Discussing Radiation and its spectrum.		
				1	Terms used in Illuminations.		
				1	Explain inverse square law , cosine law and polar curves.		
						1	Describe light distribution and Explain maintenance factor and depreciation factors.
			8			1	Design simple lighting schemes and depreciation factor
						1	Constructional feature and working of Filament lamps, effect of variation of voltage
						1	Explain Discharge lamps.
						1	State Basic idea about excitation in gas discharge lamps
			9			1	State constructional factures and operation of Fluorescent lamp. (PL and PLL Lamps)
						1	Sodium vapor lamps. 4.12. High pressure mercury vapor lamps.
						1	Neon sign lamps. High lumen output & low consumption fluorescent
						1	High lumen output & low consumption fluorescent lamps
5	Chapter-5	10	INDUSTRIAL DRIVES				
			10	1	State group and individual drive		
				1	Method of choice of electric drives.		
				1	Explain starting and running characteristics of DC motor		
				1	Explain starting and running characteristics of ac motor		
			11	1	State Application of DC motor.		
				1	State Application of 3 phase induction motor		
				1	State Application of 3 phase synchronous motor		
				1	State Application of single phase induction motor		
			12	1	State Application of series motor		
				1	State Application of universal motor and repulsion motor		
			6	Chapter 6	14	ELCTRIC TRACTION	
12	1	Explain system of traction					
	1	System of Track electrification					
13	1	Explain control of motor					
	1	Tapped field control of motor					
	1	Rheostatic control of motor					
	1	Series parallel control of motor					
14	1	Multi-unit control of motor					
	1	Metadyne control of motor					
	1	Explain Braking system					
	1	Regenerative Braking					
15	1	Braking with 1-phase series motor					
	1	Magnetic Braking.					
	1	Running Characteristics of DC traction motor					
	1	Running Characteristics AC traction motor					