

UTKAL GOURAV MADHUSUDAN INSTITUTE OF TECHNOLOGY, RAYAGADA
DEPARTMENT OF ELECTRICAL ENGINEERING

Academic Lesson Plan for 5th Semester – 2023-24 (Winter)
Subject: UTILISATION OF ELECTRICAL ENERGY & TRACTION (TH 4)
Name of the teaching faculty- Miss Sarita Bauri ,PTGF (ELECTRICAL ENGG.)

SEMESTER FROM DATE:01/08/2023 TO DATE:30/11/2023	No. of periods per week: 4 NO.OF WEEKS:15 Total periods: 60	Internal Exam. : 20 Marks End Semester Exam.: 80 Marks Total Marks: 100 Marks
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WEEK	CLASS DAY	UNIT	THEORY/PRACTICAL TOPICS	REMARK
1ST	1ST	ELECTROLYTIC PROCESS	Definition and Basic principle of Electro Deposition. & Important terms regarding electrolysis.	
	2ND	ELECTROLYTIC PROCESS	Faradays Laws of Electrolysis	
	3RD	ELECTROLYTIC PROCESS	Definitions of current efficiency, Energy efficiency.	
	4TH	ELECTROLYTIC PROCESS	Principle of Electro Deposition	
2ND	1ST	ELECTROLYTIC PROCESS	Factors affecting the amount of Electro Deposition.	
	2ND	ELECTROLYTIC PROCESS	Factors governing the electro deposition.	
	3RD	ELECTROLYTIC PROCESS	State simple example of extraction of metals	
	4TH	ELECTROLYTIC PROCESS	Application of Electrolysis.	
3RD	1ST	ELECTRICAL HEATING	Advantages of electrical heating & Mode of heat transfer and Stephen's Law.	
	2ND	ELECTRICAL HEATING	Principle of Resistance heating. (Direct resistance and indirect resistance heating.)	
	3RD	ELECTRICAL HEATING	Working principle of direct arc furnace and indirect arc furnace.	
	4TH	ELECTRICAL HEATING	Principle of Induction heating	
4TH	1ST	ELECTRICAL HEATING	Working principle of direct core type, vertical core type and indirect core type Induction furnace.	
	2ND	ELECTRICAL HEATING	Principle of coreless induction furnace and skin effect	
	3RD	ELECTRICAL HEATING	Principle of dielectric heating and its application	
	4TH	ELECTRICAL HEATING	Principle of Microwave heating and its application	
5TH	1ST	PRINCIPLES OF ARC WELDING	Explain principle of arc welding	
	2ND	PRINCIPLES OF ARC WELDING		
	3RD	PRINCIPLES OF		D. C. & A. C. Arc phenomena

		ARC WELDING		
	4TH	PRINCIPLES OF ARC WELDING	D.C. & A. C. arc welding plants of single and multi-operation type.	
6TH	1ST	PRINCIPLES OF ARC WELDING	Types of arc welding.	
	2ND	PRINCIPLES OF ARC WELDING	Explain principles of resistance welding.	
	3RD	PRINCIPLES OF ARC WELDING	Descriptive study of different resistance welding methods.	
	4TH	PRINCIPLES OF ARC WELDING		
7TH	1ST	ILLUMINATION	Nature of Radiation and its spectrum. & Terms used in Illuminations. [Lumen, Luminous intensity, Intensity of illumination, MHCP, MSCP, MHSCP, Solid angle, Brightness, Luminous efficiency.]	
	2ND	ILLUMINATION	Explain the inverse square law and the cosine law	
	3RD	ILLUMINATION	Explain polar curves. & Describe light distribution and control. Explain related definitions like maintenance factor and depreciation factors.	
	4TH	ILLUMINATION	Design simple lighting schemes and depreciation factor.	
8TH	1ST	ILLUMINATION	Constructional feature and working of Filament lamps, effect of variation of voltage on working of filament lamps.	
	2ND	ILLUMINATION	Explain Discharge lamps.	
	3RD	ILLUMINATION	State Basic idea about excitation in gas discharge lamps.	
	4TH	ILLUMINATION	State constructional features and operation of Fluorescent lamp. (PL and PLL Lamps)	
9TH	1ST	ILLUMINATION	Sodium vapor lamps.	
	2ND	ILLUMINATION	High pressure mercury vapor lamps.	
	3RD	ILLUMINATION	Neon sign lamps.	
	4TH	ILLUMINATION	High lumen output & low consumption fluorescent lamps.	
10TH	1ST	INDUSTRIAL DRIVES	State group and individual drive.	
	2ND	INDUSTRIAL DRIVES		
	3RD	INDUSTRIAL DRIVES	Method of choice of electric drives.	
	4TH	INDUSTRIAL DRIVES	Explain starting and running characteristics of DC and AC motor.	
11TH	1ST	INDUSTRIAL DRIVES		
	2ND	INDUSTRIAL DRIVES	State Application of DC motor.	
	3RD	INDUSTRIAL DRIVES	State Application of 3-phase induction motor.	

	4TH	INDUSTRIAL DRIVES	State Application of 3 phase synchronous motors.	
12TH	1ST	INDUSTRIAL DRIVES	State Application of Single phase induction, series motor, universal motor and repulsion motor.	
	2ND	INDUSTRIAL DRIVES		
	3RD	ELECTRIC TRACTION	Explain system of traction.	
	4TH	ELECTRIC TRACTION	System of Track electrification	
13TH	1ST	ELECTRIC TRACTION		
	2ND	ELECTRIC TRACTION	Running Characteristics of DC and AC traction motor	
	3RD	ELECTRIC TRACTION	Explain control of motor	
	4TH	ELECTRIC TRACTION	Tapped field control	
14TH	1ST	ELECTRIC TRACTION	Rheostatic control.	
	2ND	ELECTRIC TRACTION	Series parallel control.	
	3RD	ELECTRIC TRACTION	Multi-unit control.	
	4TH	ELECTRIC TRACTION	Metadyne control.	
15 TH	1 ST	ELECTRIC TRACTION	Explain Braking of Motor	
	2 ND	ELECTRIC TRACTION	Regenerative Braking.	
	3 RD	ELECTRIC TRACTION	Braking with 1-phase series motor.	
	4 TH	ELECTRIC TRACTION	Magnetic Braking.	