



GOVERNMENT POLYTECHNIC, PURI

DEPARTMENT OF ELECTRICAL ENGINEERING

Discipline: ELECTRICAL ENGINEERING	Semester: 5TH	Name of the Teaching Faculty: MR. NILAKANTHA NAIK LECTURE IN ELECTRICAL ENGINEERING	
Subject: UEET	No. of classes allotted per week: 04	Semester From date: 01.08.2023 To Date: 30.11.2023 No. of Weeks: 15	
PRE- REQUISITE	Basic knowledge of AC/DC current, charge, mode of heat transfer, different types of motors etc.		
COURSE OUTCOMES	CO1: Able to maintain electric drives used in an industry. CO2: Able to identify the heating and welding scheme for a given application. CO3: Able to maintain/ trouble shoot various lamps and fitting in use. CO4: Understand the types of electrical heating as employed in the electrical oven, induction furnaces and arc furnaces and dielectrically ovens. CO5: Understand the principle of ionic dissociation and electrolysis and loss involving in the process, usage of this process.		
Week	Class Day	Theory/Practical Topics	DELIVERY METHOD
1 ST	1 ST	Definition and Basic principle of Electro Deposition.	Whiteboard
	2 ND	Important terms regarding electrolysis.	Whiteboard
	3 RD	Faradays Laws of Electrolysis.	Whiteboard
	4 TH	Definitions of current efficiency, Energy efficiency.	Whiteboard
2 ND	1 ST	Principle of Electro Deposition.	Whiteboard
	2 ND	Factors affecting the amount of Electro Deposition.	Whiteboard
	3 RD	Factors governing the electro deposition	Whiteboard
	4 TH	QUIZ&ASSIGNMENT-I	Lecture notes
3 RD	1 ST	State simple example of extraction of metals.	Whiteboard
	2 ND	Application of Electrolysis.	Whiteboard
	3 RD	Advantages of electrical heating.	Whiteboard
	4 TH	Mode of heat transfer and Stephen’s Law	Whiteboard
4 TH	1 ST	Principle of Resistance heating. (Direct resistance and indirect resistance heating.)	Whiteboard
	2 ND	Discuss working principle of direct arc furnace and indirect arc furnace.	Whiteboard
	3 RD	QUIZ&ASSIGNMENT-II	Lecture notes
	4 TH	Principle of Induction heating. 2.5.1. Working principle of direct core type, vertical core type and indirect core type Induction furnace. 2.5.2. Principle of coreless induction furnace and skin effect	Whiteboard
5 TH	1 ST	Principle of dielectric heating and its application.	Whiteboard
	2 ND	Principle of Microwave heating and its application.	Whiteboard
	3 RD	QUIZ&ASSIGNMENT-III	Lecture notes
	4 TH	Explain principle of arc welding.	Whiteboard
6 TH	1 ST	Discuss D. C. & A. C. Arc phenomena.	Whiteboard
	2 ND	D.C. & A. C. arc welding plants of single and multi-operation type.	Whiteboard
	3 RD	QUIZ&ASSIGNMENT-IV	Lecture notes
	4 TH	Types of arc welding	Whiteboard

7 TH	1 ST	Explain principles of resistance welding	Whiteboard
	2 ND	Descriptive study of different resistance welding methods.	Whiteboard
	3 RD	Nature of Radiation and its spectrum.	Whiteboard
	4 TH	Terms used in Illuminations. [Lumen, Luminous intensity, Intensity of illumination, MHCP, MSCP, MHSCP, Solid angle, Brightness, Luminous efficiency.]	Whiteboard
8 TH	1 ST	QUIZ&ASSIGNMENT-V	Lecture notes
	2 ND	. Explain the inverse square law and the cosine law.	Whiteboard
	3 RD	Explain polar curves.	Whiteboard
	4 TH	Describe light distribution and control. Explain related definitions like maintenance factor and depreciation factors	Whiteboard
9 TH	1 ST	Design simple lighting schemes and depreciation factor.	Whiteboard
	2 ND	Constructional feature and working of Filament lamps, effect of variation of voltage on working of filament lamps	Whiteboard
	3 RD	Explain Discharge lamps	Whiteboard
	4 TH	State Basic idea about excitation in gas discharge lamps	Whiteboard
10 TH	1 ST	State constructional factures and operation of Fluorescent lamp. (PL and PLL Lamps)	Whiteboard
	2 ND	Sodium vapor lamps.	Whiteboard
	3 RD	High pressure mercury vapor lamps	Whiteboard
	4 TH	Neon sign lamps..	Whiteboard
11 TH	1 ST	QUIZ&ASSIGNMENT-VI	Lecture notes
	2 ND	High lumen output & low consumption fluorescent lamps	Whiteboard
	3 RD	State group and individual drive	Whiteboard
	4 TH	Method of choice of electric drives.	Whiteboard
12 TH	1 ST	Explain starting and running characteristics of DC and AC motor..	Whiteboard
	2 ND	QUIZ&ASSIGNMENT-VII	Lecture notes
	3 RD	State Application of : 5.4.1. DC motor. 5.4.2. 3-phase induction motor. 5.4.3. 3 phase synchronous motors. 5.4.4. Single phase induction, series motor, universal motor and repulsion motor.	Whiteboard
	4 TH	Explain system of traction.	Whiteboard
13 TH	1 ST	System of Track electrification.	Whiteboard
	2 ND	QUIZ&ASSIGNMENT-VIII	Lecture notes
	3 RD	Running Characteristics of DC and AC traction motor.	Whiteboard
	4 TH	Explain control of motor: 6.4.1. Tapped field control. 6.4.2. Rheostatic control 6.4.3. Series parallel control. 6.4.4. Multi-unit control. 6.4.5. Metadyne control.	Whiteboard
14 TH	1 ST	Explain Braking of the following types: 6.5.1. Regenerative Braking. 6.5.2. Braking with 1-phase series motor. 6.5.3. Magnetic Braking.	
	2 ND	QUIZ&ASSIGNMENT-IX	Lecture notes
	3 RD	Revision	
	4 TH	Revision	
15 TH	1 ST	Revision	
	2 ND	Revision	
	3 RD	Revision	
	4 TH	Revision	

LEARNING RESOURCES:

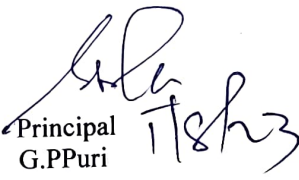
1. Utilization of Electrical Energy by Traction G. C. Garg by Khanna Publisher
2. Utilization of Electrical Energy E. I. Taylor by TMH

WEBSITE RESOURCES:

<https://youtu.be/cvQ5tss5sfA?si=pIQWnA-ifZ2vX4hp>

<https://youtu.be/fQrZMMWo1mA?si=9xrYMFekLMskbOUD>


Sign. of Faculty concerned


Principal
G. PPuri


Sign. of HOD