

Discipline :Electrical Engineering	Semester:-5th Sem	Name of the teaching faculty:- MANMOHAN PANDA
Subject:-Utilization of Electrical Energy & Traction	No. of Days/week class Allotted :-4	No. of weeks:-15 Session 2025-2026 (Winter) Starting date - 14/07/2025 Closing date - 15/11/25
No. of week	No. of class	Topic to be Taught
1 st	1 st	ELECTROLYTIC PROCESS Definition and Basic principle of Electro Deposition
	2 nd	Important terms regarding electrolysis Faradays Laws of Electrolysis
	3 rd	Definitions of current efficiency, Energy efficiency. Principle of Electro Deposition
	4 th	Factors affecting the amount of Electro Deposition
2 nd	1 st	Factors governing the electro deposition
	2 nd	State simple example of extraction of metals
	3 rd	State simple example of extraction of metals
	4 th	Application of Electrolysis
3 rd	1 st	ELECTRICAL HEATING Advantages of electrical heating
	2 nd	Mode of heat transfer and Stephen's Law
	3 rd	Principle of Resistance heating. (Direct resistance and indirect resistance heating.)
	4 th	Discuss working principle of direct arc furnace and indirect arc furnace
4 th	1 st	Principle of Induction heating Working principle of direct core type, vertical core type and indirect core type Induction furnace
	2 nd	Principle of coreless induction furnace and skin effect
	3 rd	Principle of dielectric heating and its application
	4 th	Principle of Microwave heating and its application
5 th	1 st	PRINCIPLES OF ARC WELDING Principle of arc welding
	2 nd	Discuss D. C. & A. C. Arc phenomena
	3 rd	D.C. & A. C. arc welding plants of single and multi-operation type
	4 th	Types of arc welding
	1 st	Types of arc welding
		Principles of resistance welding

6th	2 nd	
	3 rd	Descriptive study of different resistance welding methods
	4 th	Descriptive study of different resistance welding methods
7th	1 st	ILLUMINATION Nature of Radiation and its spectrum
	2 nd	Terms used in Illuminations. [Lumen, Luminous intensity, Intensity of illumination, MHCP, MSCP, MHSCP, Solid angle, Brightness, Luminous efficiency.]
	3 rd	Explain the inverse square law and the cosine law Explain polar curves
	4 th	Describe light distribution and control Explain related definitions like maintenance factor and depreciation factors
8th	1 st	Design simple lighting schemes and depreciation factor
	2 nd	Constructional feature and working of Filament lamps, effect of variation of voltage on working of filament lamps
	3 rd	Discharge lamps. Basic idea about excitation in gas discharge lamps
	4 th	Constructional features and operation of Fluorescent lamp. (PL and PLLamps)
9th	1 st	Constructional features and operation of Sodium vapour lamps
	2 nd	Constructional features and operation of High pressure mercury vapour lamps
	3 rd	Constructional features and operation of Neon sign lamps
	4 th	Constructional features and operation of High lumen output & low consumption fluorescent lamps
10th	1 st	INDUSTRIAL DRIVES State group and individual drive
	2 nd	Method of choice of electric drives
	3 rd	Starting and running characteristics of DC and AC motor
	4 th	Starting and running characteristics of DC and AC motor
11th	1 st	Application of DC motors
	2 nd	Application of 3-phase induction motors
	3 rd	Application of 3 phase synchronous motors
	4 th	Application of Single phase induction motors

12 th	1 st	Application of Series motors,
	2 nd	Application of universal motors and repulsion motors
	3 rd	ELECTRIC TRACTION Explain system of traction
	4 th	System of Track electrification
13 th	1 st	Running Characteristics of DC and AC traction motor
	2 nd	Running Characteristics of DC and AC traction motor
	3 rd	Running Characteristics of DC and AC traction motor
	4 th	Explain control of motor
14 th	1 st	Tapped field control
	2 nd	Rheostatic control
	3 rd	Series parallel control
	4 th	Multi-unit control:
15 th	1 st	Metadyne control
	2 nd	Braking of the following types Regenerative Braking.
	3 rd	Braking with 1-phase series motor
	4 th	Magnetic Braking.

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10/07/2025

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