

COURSE CODE: 1154EE105	COURSE TITLE: INDUSTRIAL ELECTRICAL SYSTEMS	L	T	P	C
		3	0	0	3

COURSE CATEGORY:

University Elective

PREAMBLE :

This course helps to understand about overview of Electric systems in manufacturing

PREREQUISITE COURSES:

Basic Electrical Engineering

RELATED COURSES:

Utilization of electrical energy

COURSE EDUCATIONAL OBJECTIVES :

The objectives of the course are to make the students,

- Introduce various methods of effectively and efficiently utilizing Electrical Energy for different and desired applications
- Teach the various Electrical Lighting principles and their applications.
- Impart knowledge on effective utilization of Electrical Drives, Electrical Traction and Electro Mechanical process

COURSE OUTCOMES :

Upon the successful completion of the course, students will be able to:

CO Nos.	Course Outcomes	Knowledge Level (Based on revised Bloom's Taxonomy)
CO1	Basics about electrical equipment's in manufacturing	K2
CO2	Application of electrical equipment's in different types of industries	K2
CO3	Types and working of electric traction systems	K2
CO4	Industry oriented consumption of electrical energy	K2
CO5	Basics about Illumination and its types	K2

CORRELATION OF COs AND POs

COs	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2
CO1	H											
CO2	H							H		M	H	
CO3	H			H				H		M	H	
CO4		M	M	L		M		M		M		
CO5										H		

H-High: M: Medium L-Low.

COURSE CONTENT :		
UNIT I	ELECTRIC DRIVES AND CONTROL	9
Group drive – Individual drive – selection of motors – starting and running characteristics– Mechanical features of electric motors – Drives for different industrial applications - Choice of drives – power requirement calculation.		
UNIT II	ELECTROMECHANICAL PROCESSES	9
Electrolysis – polarization factor – preparation work for Electro plating – Tanks and other equipments – Calculation of energy requirements – Methods of charging and maintenance – Ni-iron and Ni- cadmium batteries –Lead acid batteries ,Components and materials – Chemical reactions – Capacity rating of batteries – Battery charges.		
UNIT III	ELECTRIC TRACTION	9
Traction system – Speed time characteristics – Series and parallel control of D.C motors - Open circuited, shunt and bridge transitions – Tractive effort calculation – Electric braking – Tramways and trolley bus – A.C traction and recent trend. Magnetic deviation		
UNIT IV	ELECTRIC HEATING AND WELDING	9
Resistance, Inductance and Arc furnaces – Construction and fields of application – Losses in oven and efficiency - High frequency - Dielectric heating – Characteristics of carbon and metallic arc welding – butt welding – spot welding.		
UNIT V	ILLUMINATION	9
Production of light – Determination of MHCP and MSCP – Polar curves of different types of sources – Rousseau's construction – Lighting schemes and calculations – Factory lighting – Flood lighting – Electric lamps – Gaseous discharge – High pressure and low pressure.		
TOTAL: 45 PERIODS		
TEXTBOOKS:		
<ol style="list-style-type: none"> 1. Uppal S.L, "Electric Power", Khanna Publishers, 1988 1. Open Shaw Taylor, "Utilization of Electrical Energy", Oriented Longmans Limited (Revised in SI Units), 1971. 2. Soni A. Chakrabarti, M.L.Soni, P.V.Gupta, U.S.Bhatnagar, “ A text book on Power System Enggineering”, Khanna Publishers, 2000. 3. A.I.Starr, “Generation, Transmission and Utilization of Electric Power”, ELBS, 1978. 		
REFERENCE BOOKS:		
<ol style="list-style-type: none"> 1. Partab , Art and Science of Utilization of Electrical Energy. 2. E. O. Taylor, Utilization of Electric Energy. 3. C. L Wadhwa , Generation ,Distribution and Utilization of Electrical Energy 		