

III Year II Semester

L T P C

Code: 20EE6013

3 0 0 3

UTILIZATION OF ELECTRICAL ENERGY

Preamble: This subject gives a comprehensive idea in utilization of electrical power such as electric heating, electric welding and illumination and electric traction.

Course Objectives

1. To give a comprehensive idea in utilization of electrical Energy
2. To impart knowledge on electric heating and electric welding
3. To understand basic principles of light control and types of light schemes.
4. To impart how to design the traction system considering economic and technology up gradation.

Course Outcomes

1. Student will be able to identify a heating and welding scheme for a given application
2. Student will be able to classify types of electric light sources based on nature of operation and their objectives, performance and reliability.
3. Student will be able to examine various applications in indoor and outdoor application areas where use of light sources are essential.
4. Student will be able to figure-out the different schemes of traction schemes and its main components
5. Student will be able to choose proper traction systems depending upon application considering economic and technology up-gradation.

Correlation of COs with POs & PSOs:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO 1	1	2	-	-	-	-	1	1	-	-	-	-	2	-	-
CO 2	1	2	1	-	-	-	1	1	-	-	-	-	2	-	-
CO 3	-	2	1	-	-	-	1	1	-	-	-	-	2	-	-
CO 4	1	2	1	-	-	-	1	1	-	-	-	-	2	-	-
CO 5	-	2	1	-	-	-	1	1	-	-	-	-	2	-	-

1 – Weak, 2 – Moderate and 3 – Strong

Unit – I: Electric Heating and Welding

12 Hours

Advantages and methods of electric heating, resistance heating induction heating and dielectric heating. Electric welding, resistance and arc welding, electric welding equipment, comparison between A.C. and D.C. Welding, numerical problems (Elementary Level).

Unit – II: Illumination Fundamentals

12 Hours

Introduction, terms used in illumination, laws of illumination, polar curves, photometry, integrating sphere, sources of light, numerical problems (Elementary Level).

Unit – III: Various Illumination Methods**12 Hours**

Discharge lamps, MV and SV lamps – comparison between tungsten filament lamps and fluorescent tubes, Basic principles of light control, Types and design of lighting and floodlighting, numerical problems(Elementary Level).

Unit – IV: Electric Traction – I**12 Hours**

System of electric traction and traction electrification, special features of traction motors, overhead electrical equipment – collectors – modern electric locomotive – methods of track electrification.

Unit – V: Electric Traction – II**12 Hours**

Mechanics of train movement, speed-time curves for different services – trapezoidal and quadrilateral speed time curves, numerical problems (Elementary Level).

Text Books:

1. Utilisation of Electric Energy – by E. Openshaw Taylor
2. Art & Science of Utilization of electrical Energy – by Partab

Reference Books:

1. Utilization of Electrical Power including Electric drives and Electric traction – by N.V.Suryanarayana, New Age International (P) Limited, Publishers, 1996.
2. Generation, Distribution and Utilization of electrical Energy – by C.L. Wadhwa, New Age International (P) Limited, Publishers, 1997.