

Industrial Electrical Systems (ELPE412)

L T P Cr
3 0 0 3

Theory: 75
Class Work: 25
Total: 100
Duration of Exam: 3 Hrs

Name of the Teacher: Nitin Goel

Class: B.Tech (EL) 4th Semester

Unit No.	Topic to be covered	Hours
1	Electrical System Components LT system wiring components, selection of cables, wires, switches, distribution box, metering system, Tariff structure, protection components- Fuse, MCB, MCCB, ELCB, inverse current characteristics, symbols, single line diagram (SLD) of a wiring system, Contactor, Isolator, Relays, MPCB, Electric shock and Electrical safety practices	6
2	Residential and Commercial Electrical Systems Types of residential and commercial wiring systems, general rules and guidelines for installation, load calculation and sizing of wire, rating of main switch, distribution board and protection devices, earthing system calculations, requirements of commercial installation, deciding lighting scheme and number of lamps, earthing of commercial installation, selection and sizing of components.	5
3	Illumination Systems Understanding various terms regarding light, lumen, intensity, candle power, lamp efficiency, specific consumption, glare, space to height ratio, waste light factor, depreciation factor, various illumination schemes, Incandescent lamps and modern luminaries like CFL, LED and their operation, energy saving in illumination systems, design of a lighting scheme for a residential and commercial premises, flood lighting.	5
4	Industrial Electrical Systems I HT connection, industrial substation, Transformer selection, Industrial loads, motors, starting of motors, SLD, Cable and Switchgear selection, Lightning Protection, Earthing design, Power factor correction – kVAR calculations, type of compensation, Introduction to PCC, MCC panels. Specifications of LT Breakers, MCB and other LT panel components	8
5	Industrial Electrical Systems II DG Systems, UPS System, Electrical Systems for the elevators, Battery banks, Sizing the DG, UPS and Battery Banks, Selection of UPS and Battery Banks	4
6	Industrial Electrical System Automation Study of basic PLC, Role of in automation, advantages of process automation, PLC based control system design, Panel Metering and Introduction to SCADA system for distribution automation	4

Total lectures - 32

Text/Reference Books

1. S. L. Uppal and G. C. Garg, "Electrical Wiring, Estimating & Costing", Khanna publishers, 2008.
2. K. B. Raina, "Electrical Design, Estimating & Costing", New age International, 2007.
3. S. Singh and R. D. Singh, "Electrical estimating and costing", Dhanpat Rai and Co., 1997. Web site for IS Standards.
4. H. Joshi, "Residential Commercial and Industrial Systems", McGraw Hill Education, 2008