

BPE605	Industrial Electrical Systems	3L:0T:0P	
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Course Outcomes:

- At the end of this course, students will demonstrate the ability to
- Understand the electrical wiring systems for residential, commercial consumers, representing the systems with standard symbols and drawings.
 - Understand various components of industrial electrical systems.
 - Analyze and select the proper size of various electrical system components.

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Module 1: Electrical System Components (8 Hours)

LT system wiring components, selection of cables, wires, switches, distribution boxes, metering system, Tariff structure, protection components- Fuse, MCB, MCCB, inverse current characteristics, symbols, single line diagram (SLD) of a system, Contactor, Isolator, Relays, MPCB, Electric shock and Electrical safety practices.

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Module 2: Residential and Commercial Electrical Systems (8 Hours)

Types of residential and commercial wiring systems, general rules and regulations for installation, load calculation and sizing of wire, rating of main switch, distribution and protection devices, earthing system calculations, requirements of commercial installations, deciding lighting scheme and number of lamps, earthing of commercial installations and sizing of components.

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Module 3: Illumination Systems (6 Hours)

Understanding various terms regarding light, lumen, intensity, candle power, lamp efficiency, specific consumption, glare, space to height ratio, waste light factor, illumination factor, various illumination schemes, Incandescent lamps and modern lighting, CFL, LED and their operation, energy saving in illumination systems, design of a lighting scheme for a residential and commercial premises, flood lighting.

Module 4: Industrial Electrical Systems I (8 Hours)

HT connection, industrial substation, Transformer selection, Industrial loads, starting of motors, SLD, Cable and Switchgear selection, Lightning Protection, Power factor correction – kVAR calculations, type of compensation, LT panel, MCC panels. Specifications of LT Breakers, MCB and other LT panel components.

Module 5: Industrial Electrical Systems II (6 Hours)

DG Systems, UPS System, Electrical Systems for the elevators, Battery banks for the DG, UPS and Battery Banks, Selection of UPS and Battery Banks.

Module 6: Industrial Electrical System Automation (6 Hours)

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 process automation.

Text/Reference Books

1. S. L. Uppal and G. C. Garg, "Electrical Wiring, Estimating & Costing", Tata publishers, 2008.
2. S. Singh and R. D. Singh, "Electrical estimating and costing", Dharmapal, 1997.
3. Web site for IS Standards.
4. H. Joshi, "Residential Commercial and Industrial Systems", McGraw Hill Education, 2008.


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