

Maulana Abul Kalam Azad University of Technology, West Bengal

(Formerly West Bengal University of Technology)

Syllabus for B. Tech in Electrical Engineering

(Applicable from the academic session 2018-2019)

Name of the course	INDUSTRIAL ELECTRICAL SYSTEMS
Course Code: PE-EE-602C	Semester: 6th
Duration: 6 months	Maximum Marks: 100
Teaching Scheme	Examination Scheme
Theory: 3 hrs/week	Mid Semester Exam: 15 Marks
Tutorial: 0 hr/week	Assignment & Quiz: 10 Marks
Credit Points: 3	Attendance: 05 Marks
	End Semester Exam: 70 Marks

Objective:

1. To understand the electrical wiring systems with standard symbols , drawings and SLD for residential, commercial and industrial consumers
2. To understand various components of industrial electrical systems
3. To analyze and select the proper size of various electrical system components
4. To understand methods of automation of Industrial Electrical Systems
5. To solve numerical problems on the topics studied

Pre-Requisite

1. Power system-I (PC-EE-502)
2. Control system (PC-EE-503)
3. Power Electronics (PC-EE-504)

Unit	Content	Hrs	Marks
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	06	
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.	08	
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 luminaires like CFL, LED and their operation, energy saving in illumination systems, design of a lighting scheme for a residential and commercial premises, flood lighting.	06	
	Industrial Electrical Systems I: HT connection, industrial substation, Transformer selection, Industrial loads, motors, starting		

4	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.	06	
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.	06	
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.	06	

Text book:

1. Electrical Wiring, Estimating & Costing, S. L. Uppal and G. C. Garg, Khanna publishers, 2008.
2. Electrical Design, Estimating & Costing, K. B. Raina, New age International, 2007.

Reference books

1. Electrical estimating and costing, S. Singh and R. D. Singh, Dhanpat Rai and Co., 1997.
2. Web site for IS Standards.
3. Residential Commercial and Industrial Systems, H. Joshi, McGraw Hill Education, 2008.

Course Outcome:

After completion of this course, the learners will be able to

1. Represent electrical wiring system for residential, commercial and industrial consumers.
2. Determine the rating of components of residential and commercial electrical systems.
3. Design lighting scheme for a residential and commercial premises.
4. Select transformer, switchgear, protection equipments for industrial electrical systems.
5. explain methods of automation of Industrial Electrical Systems
6. Solve numerical problems related to earthing system, lighting scheme, power factor correction.

Special Remarks (if any)

The above-mentioned outcomes are not limited. Institute may redefine outcomes based their program educational objective.