

SYLLABUS

EE3105PE: Electrical Installation and Estimation

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Prerequisites: A course on —Electrical basics and power systems.

Course Objectives:

- To emphasize the estimation and costing aspects of all electrical equipment, installation and designs on the cost viability.
- To design and estimation of wiring
- To design overhead and underground distribution lines, substations and illumination.

Course Outcomes:

- Understand the design considerations of electrical installations.
- Design electrical installation for buildings and small industries.
- Identify and design the various types of light sources for different applications.

UNIT – I

Wiring Systems and Safety Procedures

Introduction, importance of electrical wiring, uses of cables, standard wire gauge, size and current carrying capacity of a wire/cable, systems of wiring, electrical wiring accessories, safety accessories, safety procedures, reason for not using fuse in neutral wire, electric shock, procedure for first-aid in case of electric shock.

UNIT – II

Estimation of Lighting and Power Loads

Introduction, types of service mains, selection of service main, selection of system wiring, drawing a wire/cable through a conduit, list of electrical materials & their approximate rates, problems on internal wiring scheme, wiring layouts of a office building, work shop, industry,/cement factory/sugar factory, hotel with a 4-storied with lift arrangement, estimation of power load, single line diagram, types of wiring system, size of cable/wire, materials used in power wiring and their rates, estimation of irrigation pump sets, submersible irrigation pump sets, material used in irrigation pump sets.

UNIT - III

Estimation of Overhead Lines and Earthing

Introduction, main components of overhead lines, conductors, insulators, cross-arms and clamps, guys and stays, steps to solve problems on estimation of OH lines, estimation of pole and plinth mounted substations, construction of pole and plinth mounted substations, estimation of materials electrical accessories of pole and plinth mounted transformers, earthing, selection of earthing, earth resistance, methods of reducing earth resistance, estimation of materials for pipe and plate earthing.

UNIT - IV

Estimating and Costing of Repairs and Maintenance of Electrical Devices and Equipment

D.O.L. starter, small motor, mono block pump, automatic electric iron, table/ceiling fan, ICDP/ICTP Switch, Preparation of detailed drawing work of the product, Preparation of material quantity sheet for the product, Materials and cost required for maintenance work, Estimation of repairing cost and overall cost, Tools used for repairs & maintenance work Preparation of cost schedule for repair and maintenance of electric fan, automatic electric iron, single phase transformer, mixer grinder, D.O.L starter.

UNIT - V

Departmental Test, REC and Electrical Act 2003

Introduction, departmental procedure for obtaining a service connection, insulation resistance desirable for electrical installation, earth resistance to be maintained for an electric installation, testing of wiring installation, rural electrification scheme, survey of load in a village, capacity of transformer, location of transformer, estimation of electrification of a village, economic feasibility of the scheme, Indian electricity(I.E) rules, general conditions for supply and use of energy, electric supply lines, systems and apparatus for low and medium voltages.

TEXT BOOKS:

1. K. B. Raina, S. K. Bhattacharyal, —Electrical Design Estimating and Costingll, New Age International Publisher, 2010.
2. Er. V. K. Jain, Er. Amitabh Bajajll, —Design of Electrical Installationsll, University Science Press.

REFERENCE BOOKS:

1. Electrical installation and estimation, by K. Manjunath, Falcon publications.
2. Gupta J. B., Katson, Ludhiana, —Electrical Installation, estimating and costing, S. K. Kataria and sons, 2013.
3. Bureau of Indian standards, Electricity supply act-1948.
4. Code of practice for Electrical wiring installations,(System voltage not exceeding 650 volts), Indian Standard Institution, IS: 732-1983.
5. Guide for Electrical layout in residential buildings, Indian Standard Institution, IS: 4648-1968.