



MORIKUS
INDUSTRIAL TRAINING INSTITUTE



COURSES MODULE FOR
**ELECTRICAL DESIGN
ENGINEERING**

COURSE OUTLINE



- ❖ Coordination with Other Disciplines
- ❖ Electrical Drawings, Documentation and Schematics
- ❖ Estimation of Plant Electrical Load
- ❖ Power Distribution
- ❖ Switchgear for Power Distribution
- ❖ Development of Single Line Diagrams (SLD)
- ❖ Control Schematics
- ❖ Selection and Sizing of Electrical Equipments
- ❖ Hazardous Area Classification and Selection of Equipments
- ❖ Cable Selection and Sizing
- ❖ Cable Routing
- ❖ Power System Protection and Co-ordination
- ❖ Electrical Safety and Grounding/Earthing, Bonding and Lightning Protection
- ❖ Power Quality, Uninterruptible Power Supplies, Surge Protection and Noise Control
- ❖ Illumination Design
- ❖ Sub-Station/ Switch Yard Layout and Design
- ❖ Procurement details of Electrical Equipment and Specification
- ❖ Electrical Applications to Oil & Gas / Chemicals/ Energy & Power industries.

ELECTRICAL DESIGN & DETAIL ENGINEERING

BASICS OF ELECTRICAL ENGINEERING & COORDINATION WITH OTHER DISCIPLINES

- Different types of Electrical system and their Importance
- Power Generation, Transmission, Distribution and Utilization
- Introduction of key electrical equipments used in projects
- Introduction to EBOD Electrical Basis of Designing

ESTIMATION OF PLANT ELECTRICAL LOAD

- Preparation of Load Schedule
- Determination of power Supply Capacity
- Standby Capacity consideration
- Rating of generators in Relation to their Prime Movers
- Rating Of Motors In Relation To Their Driven Machines

DEVELOPMENT OF SINGLE LINE DIAGRAMS (SLD)

- Types of SLD and their study with Legend sheet
- Detail SLD, Lighting system SLD, Small power SLD, Key SLD
- Metering and Control diagram

CONTROL SCHEMATICS

- Block Diagram
- Schematics for Motor Feeder, Power Feeder & Transformer Feeder

SELECTION AND SIZING OF ELECTRICAL EQUIPMENTS

- Emergency Generator
- Transformer and CT/PT
- Neutral Grounding Resistor (NGR)
- HV/MV Switchgears
- LV Switchgears
- HV/MV/LV Capacitor Bank
- DC Battery & Battery Charger
- AC UPS
- AC/DC Machines

HAZARDOUS AREA CLASSIFICATION AND SELECTION OF EQUIPMENTS

- Zone/Division Classification & relevant codes & Standards
- Types of Protection for Hazardous Areas
- Hazardous source List Preparation & certification of Equipments
- Marking Of Equipment Nameplates
- Hazardous Area Drawings / Layouts Preparation

CABLE SELECTION AND SIZING AND ROUTING

- Power and Control cable Introduction & cable selection
- Cable sizing for Low voltage system & High voltage system
- Voltage Drop Consideration
- Let through Energy consideration
- Earth fault Loop Impedance consideration
- Cable Schedule & Cable interconnection Schedule
- Selection and Sizing of Cable Tray
- Cable tray schedule & Drum schedule
- Conduit Sizing & Selection
- Cable routing Layout

EARTHING & LIGHTENING PROTECTION DESIGN

- Requirement of Earthing in Industrial Plants
- Earthing Design Calculations & Layout Design
- Type of Earthing and Earthing Installation Details
- Earthing Lightening Protection Requirement & Calculation
- Lightening Installation Details and Layout Design

ILLUMINATION DESIGN

- Type of Lighting Fixtures & its selection
- Preparation of Fixture Schedule
- Indoor Illumination Calculation
- Outdoor Illumination Calculation

SUB-STATION/ SWITCH YARD LAYOUT AND DESIGN

- Introduction
- Type of Sub-Stations and Layouts
- General arrangement of substation
- Equipment Layout



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