



Professional Electrical Design Master Course

(Engineering Course Bundle- 5th Months Semester Course)

LearnozTM
Learn Smart. Grow Fast.

(৭টি কোর্সের সমন্বয়ে ইলেকট্রিক্যাল ডিজাইন মাস্টার কোর্স)

১. প্রফেশনাল সাব-স্টেশন ডিজাইন (ইঞ্জিনিয়ারিং কোড বেজড)
২. ইলেকট্রিক্যাল ডিজাইন (SLD) ফর RSC অডিট
৩. ইলেকট্রিক্যাল সেফটি অডিট কোর্স (রেকর্ডেড)
৪. লাইটনিং প্রটেকশন সিস্টেম (LPS) Design (BNBC-2020 & NFPA-70)
৫. অটোক্যাড (2D & Isometric 3D)
৬. বিল্ডিং ইলেকট্রিক্যাল ডিজাইন কোড রুলস BNBC-2020 (রেকর্ডেড)
৭. ইলেকট্রিক্যাল Panel Isometric 3D Drawing (Only View Making)

কোর্স-০১
AUTO CAD (2D & ISOMETRIC 3D)

LearnozTM
Learn Smart. Grow Fast.

(Auto CAD 2D & Isometric 3D)

(Day-01-05)

i. Day-01

- ❖ **Class-1:** Introducing to Auto CAD, Line, Poly Line, Spline, Rectangle, Circle, Copy, Move, Erase, Function of Mouse, Short Commands, Ribbon, Menu bar
- ❖ **Class-2:** Arc, Object, Object Selection Method 1, 2 & 3, Functional Key F-3 & F-8 etc.
- ❖ **Class-3:** Scale, Stretch, Zoom, Draft Setting
- ❖ **Home Work:** Make a Transformer Symbol, How to on/off Menu bar, Ribbon Close & Open

ii. Day-02 (Class: 4-6) Class Duration-2Hr.

- ❖ Class-4: Offset, Trim, Extend, Unit Setting, Dimension Setting, Exercise.
- ❖ Class-5: Hatch, Details of Option command.
- ❖ Class-06: Rotate, Mirror, Joint, Break, and Break at point.
- ❖ Home Work: Make Earthing Symbol, Room layout plan, trim an object & extend etc.

Day-03 (Class: 7-9) Class Duration-2Hr.

- ❖ Class-07: Drafting Setting, Chamfer, Fillet.
- ❖ Class-08: Array, Block, Insert Block, Explode, Layer, Match.
- ❖ Class-9: Layout Making, Page Setup, Limit setting, Text.
- ❖ Home Work: Make a Fan, DB, Socket, Circuit Breaker Symbol, Generator Symbol & Converting to Block.

iii. Day-04: (Class: 10) Class Duration-2Hr.

- ❖ Making a Professional Substation SLD Project

iv. Day-05: (Class: 11) Class Duration-2Hr. (Isometric 3D)

- ❖ RCC Building 2D & Isometric 3D Drawing
- ❖ Shed Building 2D & Isometric 3D Drawing

কোর্স-০২

LIGHTNING PROTECTION SYSTEM (LPS) DESIGN

Based on BNBC-2020 & NFPA-780

LearnozTM
Learn Smart. Grow Fast.

**Course Name: Professional Lightning Protection System (LPS) Planning, Drawing & Design
According to BNBC-2020 & NFPA-780**

Class-01

i. Introduction to LPS Materials

- ❖ Air Terminal, Air Terminal Base Plate (Single & Double)
- ❖ Saddle, Introducing of Cable Joints (Squire Joint, Brass Clamp Joint etc.)
- ❖ Test Box (Copper & Bimetallic Type), Bimetallic Joint
- ❖ Earthing Busbar with Insulator, Earth Electrode, Earth Lead, ECC, Copper Wire / Lead Connector (U-Clamp), Royal Bolt, Main & Down Conductor.

ii. When Need to Install LPS for Building

- ❖ Discussion About Risk Index
- ❖ Risk Index Calculation from BNBC-2020

iii. Classification of Structure/Building Criteria for LPS Design (Class-I & II Building Selection)

- ❖ What is Class-I Structure
- ❖ What is Class-II Structure
- ❖ When Have to Use Class-I & Class-II Materials
- ❖ When Have to Use Class-I & Class-II Materials used in same structure

iv. Class-I Materials Specification

- ❖ Diameter of Air Terminal & Height (For Copper & Aluminum)
- ❖ Main Conductor & Down Conductor Size ((For Copper & Aluminum)

v. Class-II Materials Specification

- ❖ Diameter of Air Terminal & Height (For Copper & Aluminum)
- ❖ Main Conductor & Down Conductor Size ((For Copper & Aluminum)

i. Air Terminal Installation

- ❖ Maximum Spacing Between Air Terminal to Air Terminal (Condition-I)
- ❖ Maximum Spacing Between Air Terminal to Air Terminal (Condition-II)
- ❖ When Need Air Terminal Support & Why
- ❖ Tip Height of Air Terminal
- ❖ Elevation of Air Terminal
- ❖ Ornament Ball of Air Terminal

ii. Bimetallic Connector

- ❖ When Need Bimetallic Connector
- ❖ Installation of Bimetallic Connector

iii. Main & Down Conductor Installation

- ❖ Number of Down Conductor (Condition-I)
- ❖ Number of Down Conductor (Condition-II)
- ❖ Project Analysis & Calculation of Down Conductor
- ❖ Main & Down Conductor Support
- ❖ Maximum Distance of Saddle
- ❖ Conductor Bends Procedure with Details
- ❖ Location of Devices (Air Terminal)

Class-2 (Strike Termination Devices on Roof)

i. Type of Roof

- ❖ Pitched Roof
- ❖ Flat / Gently Slopping Roof
- ❖ Dormers Roof
- ❖ Domed Roof
- ❖ **Flat / Gently Slopping Roof**
- ❖ Introduction of Flat / Gently Slopping Roof
- ❖ Air Terminal Installation of Flat Roof (Condition-I)
- ❖ Air Terminal Installation of Flat Roof (Condition-II)
- ❖ When Need Run Conductor
- ❖ When Need Cross Run Conductor
- ❖ Project Design Practice in Class for Flat Roof

❖ **Pitched Roof**

- ❖ Introduction of Pitched Roof
- ❖ Air Terminal Installation of Pitched Roof (Condition-I)
- ❖ Air Terminal Installation of Pitched Roof (Condition-II)
- ❖ When Need Run Conductor
- ❖ When Need Cross Run Conductor

Class-03 (Project Design)

i. Flat/Gently Slopping Roof Project Design (RCC Building)

- ❖ Preparation of Preliminary Drawing according to actual Structure in Auto CAD (2D Drawing)
- ❖ Air Terminal Selection & Practically Drawing Preparation
- ❖ Main Conductor / Run Conductor / Cross Run Conductor Layout Drawing Preparation
- ❖ Down Conductor Selection with Proper Location
- ❖ Preparation of Earthing Drawing with Details According to Code with Consideration Environment
- ❖ Preparation of Isometric Drawing in Auto CAD

Class-04

ii. Flat/Gently Slopping Roof Project Design (Factory Shed Building)

- ❖ Preparation of Preliminary Drawing according to actual Structure in Auto CAD (2D Drawing)
- ❖ Air Terminal Selection & Practically Drawing Preparation
- ❖ Main Conductor / Run Conductor / Cross Run Conductor Layout Drawing Preparation
- ❖ Down Conductor Selection with Proper Location
- ❖ Preparation of Earthing Drawing with Details According to Code with Consideration Environment
- ❖ Preparation of Isometric Drawing in Auto CAD

Class-05 (Exam)

i. Assignment Have to Submit properly

- ❖ After passed in Exam Certificate will be provided



কোর্স-০৬

PROFESSIONAL SUBSTATION DESIGN (CODE BASED)

LearnozTM
Learn Smart. Grow Fast.

Class-01 (Preparation of Electrical Design)

vi. How to Practice Engineering Code & Related Guidelines.

- ❖ Importance of Engineering Code for Design
- ❖ Combination of Engineering Code & Practices
- ❖ Engineering Code & Team Work
- ❖ Real Life Examples
- ❖ Attached: References with Article Number & Edition

vii. Basic Idea of Electrical Design (Definition with Explanation)

- ❖ Proposed/Masterplan Drawing & Design
- ❖ As-Built Drawing
- ❖ Single Line Diagram (SLD)
- ❖ Electrical Layout Diagram
- ❖ Attached: References with Article Number & Edition

viii. Various Type of Cable

- ❖ Definition of RM, RE, SM, BYA, NYY, XLPE Cable & where use it
- ❖ Engineering Cable Code & Color Code with Details
- ❖ Electrical Load from BNBC
- ❖ Load Calculation with Short method

ix. Various Type of Circuit breaker & its uses

- ❖ Miniature Circuit Breaker (MCB) & when have to use
- ❖ Molded Case Circuit Breaker (MCCB) & when have to use
- ❖ Air Circuit Breaker (ACB) & when have to use
- ❖ Load Break Switch (LBS) Selection
- ❖ Vacuum Circuit breaker (VCB) Selection
- ❖ Circuit Breaker with Cable Combination for proper Design as per Any Audit

x. Circuit breaker Selection Method from Engineering Code for Industrial Audit

- ❖ Circuit Breaker Selection According to BNBC
- ❖ Circuit Breaker Selection According to NFPA-70 (NEC)/ACCORD/RSC Requirement
- ❖ Circuit Breaker Selection For Substation
- ❖ Discussion about Circuit Breaker Set Point

❖ Busbar Current Calculation from NFPA-70 (NEC) & Selection

- ❖ Copper Busbar Current Calculation
- ❖ Aluminum Busbar Current Calculation
- ❖ Bus bar Weight Calculation
- ❖ Available Size of Busbar
- ❖ RSC Audit CAP/Findings Discussion about Busbar

Class-02 (Substation Design)

iv. Preparation of Substation Design

- ❖ Introducing to various type of equipment of Substation
- ❖ Like Transformer, HT & LT Switchgear, PFI, CT, PT etc....

v. Transformer

- ❖ Transformer Rating/Capacity Selection
- ❖ Transformer Primary/HT Current Calculation with Short Method
- ❖ Transformer Secondary/LT Current Calculation with Short Method

vi. HT & LT Cable Selection

- ❖ HT Cable Selection with Requirements of License board
- ❖ LT Cable Selection using RSC/Any Audit Cable Chart
- ❖ Circuit Breaker with Cable Combination for proper Design as per Any Audit

vii. Voltage Drop Calculation

- ❖ Voltage Drop Calculation of Cable
- ❖ Discussion about Allowable Voltage Drop as per BNBC & NFPA-70

viii. PFI Selection

- ❖ Introducing to PFI
- ❖ Why PFI 60% (Proved using Power Triangle equation)
- ❖ PFI Static Capacitor Stage Selection
- ❖ Capacitor Current Calculation
- ❖ Magnetic Contact Selection
- ❖ HRC Fuse Selection
- ❖ Relay Controller Setting Calculation
- ❖ When need two Capacitor Panel

ix. Current Transformer (CT) & Potential Transformer (PT)

- ❖ HT CT & PT Selection (11kV Side)
- ❖ LT CT Selection

Class-03 & 04 (Earthing System)

ii. Earthing Cable Selection

- ❖ Earthing Cable Selection as per BNBC -2006 & 2020
- ❖ Earthing Cable Selection Using Adiabatic Calculation
- ❖ Thumb/Short Rules for Earthing Cable Selection

iii. Earthing System Design

- ❖ Various Type of Earthing
- ❖ Copper Rod Earthing, Copper Plate Earthing, GI Pipe Earthing
- ❖ Depth of Earth Pit
- ❖ Earth Electrode Size, Minimum Earthing Lead Size
- ❖ Difference between Earth Electrode, Earthing Lead & Earth Continuity Conductor
- ❖ Preparation of Earthing Layout for Substation & Generator
- ❖ Number of Earth Pit Selection as per BNBC & Adiabatic Equation
- ❖ One Earth Pit to Another Earth Pit Distance Requirements Discussion

iv. Transformer Earthing

- ❖ How many Earthed need for Transformer & Generator Body Earthing
 - ❖ Transformer & Generator Neutral Earthing
- Ref: BNBC & Bangladesh Electricity Act-1937

Class-05 (Substation Design Exam Preparation)

iii. Substation Design

- ❖ Assignment-01 (2000kva/More Capacity S/S Design) Must be submitted
- ❖ Online Exam Preparation



কোর্স-০৪

PROFESSIONAL ELECTRICAL DESIGN FOR INDUSTRIAL RSC AUDIT

LearnozTM
Learn Smart. Grow Fast.

PROFESSIONAL ELECTRICAL SLD DESIGN FOR INDUSTRIAL RSC AUDIT

Class-01

i. How to Field Assessment, Data Collection & Prepare Proper SLD

- ❖ How to Prepare SLD from Electrical Assessment Data
- ❖ How to Draft SLD for final Drawing
- ❖ How Many Load Information Add to SLD
- ❖ How to Prepare Proposed SLD from As-Built SLD

Class-02 (Understanding Audit CAP & SLD Correction)

iv. SLD Correction & CAP Preparation for Audit

- ❖ Understanding Audit Observation & Review of SLD
- ❖ Audit Review & Recommendation Solving
- ❖ **Home Work:** Home work for online exam.

Class-03 (BBT SYSTEM UNDERSTANDING & their SLD Making)

i. SLD of BBT System

- ❖ Introducing to BBT
- ❖ How to Prepare of SLD for BBT
- ❖ BBT Reduction Method as Per NFPA-70
- ❖ Schematic Diagram of BBT

Class-04 RSC Audit SLD Case Study & Solving to get SLD Approval from RSC Audit

ii. Necessary Case Study will be Discussed

Class-05 (Final Assignment-02 & Online Exam Preparation)

iii. Final Assignment

- ❖ Discussion About Assignment-02
- ❖ Preparation procedure of SLD for Audit
- ❖ Preparation of Load Schedule in Excel for Audit
- ❖ Online Exam Questions Idea

কোর্স-০৫

(2 hr Recorded)

ELECTRICAL SAFETY AUDIT COURSE

Class-01 & 02 (will be share Factory Visit real experience, Observation & Audit Report Preparation)

- i. About 100 Rules from Engineering Code
- ii. Pictorial Evidence
- iii. Audit Report Preparation

কোর্স-০৬

(2hr Recorded)

BUILDING ELECTRICAL DESIGN CODE RULES

Class-01 (100+ Building Electrical Code Rules Explanation)

100+ Electrical Design Code Rules From BNBC

- ❖ Importance Engineering Code Rules are included
- ❖ Each Rules will be Explained in Bangla
- ❖ Each Rules Code Reference will be mentioned with Page Number

কোর্স-০৭

3D Drawing making of Electrical Panel (2hr. Live)



LearnozTM
Learn Smart. Grow Fast.