

Course Outline

HVAC DESIGN & ENGINEERING

Introduction to HVAC

- Overview of HVAC Industry
- Scope of HVAC in an Industry
- Concept of Air-Conditioning System
- Principles of Air-Conditioning
- Air-Conditioning System Types
 - DX Cooling System
 - Centralized Air-Conditioning System
- Equipment of Air-Conditioning System
- Types of Refrigerant

Heat Load Estimation

- Basic of Heat Loss in a building envelop
- Understanding of Outdoor & Indoor Conditions
- Source of Heat Gain from Wall, Glass & Roof
- Sensible & Latent Heat Gain
- Heat Loss calculation
- Calculation of Air quantity & tonnage
- Preparation of detailed summary of Heat Loss

Air Distribution System

- Concept of Ducting requirement
- Components of Air Distribution System
- Duct Design methods
- Fan Selection
- Static Pressure Calculation
- Routing of Ducting
- Pressurization Designing
- Balance of Air Distribution System

Ventilation System

- Ventilation System requirement

- Components of Ventilation System
- Basement Ventilation System
- Kitchen Ventilation System
- Toilet Ventilation System
- Restaurant Ventilation System

Chilled Water System Design

- Introduction to Chilled Water System
- Components of Chilled Water System
- Introduction to Chillers
 - Screw Chillers
 - Centrifugal Chillers
- Refrigeration Cycle
- Pumping System Design
- Cooling Tower Design
- Pump Head Calculations
- Chilled Water Piping Designing
- Selection of Pipe Size
- Piping schematic Diagram
- Velocity & Friction Calculations
- Water quality requirement for Chilled Water System
- District Cooling System
- Localized Cooling System

Equipment Selection

- AHU & FCU selection
- DX Cooling selection
- Chiller selection
- Cooling Tower selection
- Pumping System selection
- Expansion Tank selection
- Piping System selection

Installation of Equipment

- Method statement of Chillers
- Method statement of Cooling Towers

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- Method statement of Pumps
- Method statement of Piping
- Method statement of AHU
- Method statement of FCU
- Method statement of DX System
- SLD Layout
- Cable Tray Routing
- Cable Tray Sizing
- Cable Sizing
- Earthing Sizing

Commissioning of Equipments

Estimation of Project

- Understanding tender requirement
- Preparation of BOQ
- Floating the Quotations
- Analyzing the Quotations
- Preparation of Costing sheets

Documentation

- Preparation of MAR
- Preparation of MIR
- Preparation of FAT, SAT etc.

HVAC Software's

- XL sheet for Load Calculations
- Duct Sizer for Duct sizing
- Pipe Sizer for Pipe sizing
- Psychrometry Software
- Piping Support Designing Software
- Ducting Support Designing Software
- Static Pressure Software

Fire Protection Awareness

Building Automation System (BMS)

Air Conditioning Concept

- IGBC Guidelines
- ECBC Guidelines

Heating System Designing

Electric System Designing