

HVAC Design

Objectives

Curriculum gives a taste of real-world solutions and is designed in simple modules for effective & holistic implementation. This course is totally a job-oriented program which equips the candidate with all the fundamental aspects of AC systems design, enabling to start off with a professional career in this field.

Expected Learning Outcome

1. Cooling and Heating Load Calculation: You can calculate the cooling and Heating Load Calculation based on internationally accepted Standards that even includes systems developed by CARRIER and O-GENERAL.
2. Duct Designing: You will be well equipped with the Duct Designing process based on the present industrial practice.
3. Equipment Selection: Proper Selection of Equipment based on the Project.

Who Can Learn

- Fresh as well as Experienced Engineers, Diploma Holders, Working Professionals in HVAC industry.

Job Titles

- HVAC Engineer, System Controller, HVAC draftsman man, HVAC consultant

Course Curriculum

Session 1&2: Introduction to Heating ventilation and Air conditioning, Psychrometric Chart

- Types of Heat transfer modes, Air conditioning, Forms of Heat, BTU, Abbreviation's of standards, important unit conversions, psychrometric chart and temperature properties (RH, WBT, DBT, DP), psychrometric software

Session 3&4: Refrigeration Cycle, Types of AC system

- Vapour compression cycle, Basic refrigeration system, refrigerants and their types, components of refrigeration cycle. Types of AC, Classifications, Package AC, VRV system

Session 5 & 6: Cooling and Heating load calculation

- Indoor design conditions, typical inside design conditions, outside design data, Thermal resistance for materials, overall heat transfer coefficient for components factor calculation, Heat load calculation, HAP software

Session 7& 8: O general heat load calculation, Duct Designing

- O general estimation, Ducts, Air Distribution system components, types of pressure, velocity in ducts, equal friction method, infiltration rate, duct dimensioning.

Session 9&10; Air Terminals, Toilet Ventilation

- Classification of ducts, Duct materials, Duct fittings, Plenum Designs duct design procedures, Fan Types. Types of Ventilation, exhaust air flow calculation, static pressure calculation

Session 11&12: Kitchen hood ventilation, Car parking ventilation

• Design criteria, Types of Exhaust Fan, Exhaust Hoods, Wall type and island type designs, Baffle filters, ESP, Kitchen Hood design properties and calculation, Types of car parking ventilation, Impulse and induction fans, and calculation of fresh air rate.

Session 13&14: Tunnel Ventilation, Stairwell Pressurization

• Types of tunnel ventilation, Smoke extraction management, smoke control, pressurization, single injection and multiple ways, properties on closed doors, leakage rates and pressurization calculation. (Drafting)

Session 15&16: Chillers/DX system

• Types of chillers, TRANE catalogue for performance and sizing, piping types, Valves, Pumps, Type of Heads, Chilled Water system, pump selection criteria's, NPSH, FCUS, Heat recovery system.

Session 17&18: Cooling towers, Coil selection, VRF system, District cooling

• Tower types and their characteristics, Example Calculations. Coils selection, selection procedures. Variable refrigerant flow, Advantages of VRF, District cooling, Advantages, DC components, District cooling plant Equipment, example calculation for room pressure

Session 19&20: Air Curtains, ESP, Heating system

• Evaporative Cooler Selection, classification, Advantages. Centrifugal fans, CF[®] arrangements and application, example of ESP calculation, Types of Heating system, classification of Heating system

Drafting using AutoCAD

• Kitchen Hood, Toilet ducting, AHU, examples on car parking plans, Duct sizing in AutoCAD.

Expected Skills

- Concepts of Heating ventilation and Air conditioning
- Components of Refrigeration Cycle
- Cooling and Heating load calculation
- Duct Designing
- Kitchen Hood Ventilation
- Car parking ventilation
- Chillers/DX system
- HVAC Pump Types
- Principles of cooling towers
- Coil selection basics.
- Variable Refrigerant Flow (VRF system)
- Descriptions of District cooling
- Air Curtains