€TRAINING

Air Conditioning and Refrigeration Systems

11 - 15 August 2024
Online

Air Conditioning and Refrigeration Systems

REF: O2241 DATE: 11 - 15 August 2024 Venue: Online - Fee: 2500 Euro

Introduction

Air conditioning refers to the cooling and drying of air for thermal comfort, and in its broadest sense the term can refer to any form of cooling, heating, ventilation or purification that alters the condition of the atmosphere. An air conditioner is a device, system, or mechanism designed to stabilize the air temperature and humidity within an area {used for cooling and heating depending on the air quality at a given time}, usually using cycle refrigeration but sometimes evaporation, more commonly used in comfort cooling in Most buildings and cars. The concept of air conditioning is known to have been applied in ancient Rome, where water was circulated through the walls of some homes to cool it, and similar techniques in medieval Iran included the use of tanks and wind towers to cool buildings during the hot season. Modern air conditioning results from advances in chemistry during the nineteenth century, and the first large-scale electric air conditioning was invented in 1902 by Willis Haviland Carrier.

Course Objectives

At the end of this course, the participants will be able to:

- Design cooling and ventilation systems for different types of buildings administrative - residential - industrial.
- Build technical foundations in {HVAC}.
- Design mastery using standard code.
- Know refrigeration media schedules and maps.
- Learn about the simple vapor compression cycle.
- Identify refrigeration media.
- Know the basics of air conditioning technology.

Targeted Audience

- Mechanical engineers.
- All engineers, technicians and anyone related to maintenance, production and operation.
- Specialists in the field of maintenance and technical support for air conditioning and refrigeration systems.
- Anyone who finds themselves in need of this course and wants to develop their skills and experience.

Course Outline

Unit 1:

- An introduction to the basics of thermology temperatures - amounts of heat - sensible and latent heat - methods of heat transfer.
- Types of air conditioners used in buildings and how to choose the appropriate type according to different applications {D.X. Systems, Chiller Systems, Decorative, Ducted}.
- Causes of thermal loads inside the compartments.
- Requirements to be met to start a study of load calculations for different facilities.
- Read HVAC blueprints and understand the architectural blueprint.

Unit 2:

- An introduction to the HAP program for calculating loads and how to prepare its library.

- Use the HAP program to apply to a project and read the final load calculation report.
- Identify the types of air outlets used in air conditioning systems {square diffuser, round diffuser, jet diffuser, linear bar, air grille, Swirl diffuser Perforated diffuser}.
- Selection of air outlets from different catalogs according to {Noise curves, cfm, throw, pressure drop, dimensions}.
- Distribution of air outlets in different spaces.
- The different types of duct materials manufactured for it.
- Different methods of designing duct networks and applying them to a project.
- Making an inventory of the sheet and determining the thickness of the sheet Duct gage.

Unit 3:

- Types of "Duct fitting" and how to design each part according to our name code.
- Duct Accessories, how to calibrate them, and where to install them.
- Types of internal and external Duct insulation and how to make an inventory of insulation.
- Installation and supervision of receiving the duct work at the site and testing the duct parts.
- Fan static pressure calculation.

Unit 4:

- Mechanical refrigeration circuit.
- Simple vapor compression.
- Simple refrigeration circuit components.
- Perform a simple vapor compression cycle.
- Priority cooling media.
- Selection of cooling media.
- Cooling media performance.
- Chlorofluorocarbons and the ozone layer.

Unit 5:

- Alternative cooling media.
- Brines.
- Fundamentals of air conditioning technology.
- Psychometric.
- Psychometric operations.
- Thermal loads.
- Design conditions.
- Cooling load calculations.
- Heating load calculations.