OUTSOURCING
TRAINING & CONSULTING
OTC Training Centre Sdn Bhd

HRD awards 2022
TRAINING PROVIDER

Date : 26 & 27 Feb 2025 (Wed & Thu)
Venue: Dorsett Grand Subang Hotel,Selangor

8 CDP Points
Awarded by Suruhanjaya Tenaga

2 DAYS PROGRAM

HEATING, VENTILATION & AIR-CONDITIONING (HVAC)

COURSE OVERVIEW :

This course is industry designed, to provide a broad understanding of the improvement methodology, concepts, and process. The methodology is presented with case studies and examples drawn from service, business process and industrial applications. With a heavy practice orientation, as much as a third of your time will be spent working through interactive practical exercises and assessments.

COURSE OBJECTIVES:

This training program is designed to provide an understanding of engineering related problems related to industry globally and a clear sense of what is required to effectively structure, establish measurements and solve problems. Participants will learn the goals and deliverables behind the solutions. Methodology as well as the most commonly used tools within each phase will be discussed. Participants will also learn how to support a problem solving initiative within their organization.

LEARNING OUTCOMES:

On successful completion of this course, the participant should be able to:-

- Understand the benefits and implications of HVAC design and relate the concepts to the overall business mission and objectives.
- Think about his/her organization as a collection of processes, with inputs that determine the output.
- Use the concepts of HVAC design to evaluate the capability of a process or organization.
- Recognize the engineering problem solving model used to improve processes.
- Recognize the organizational factors that are necessary groundwork for a successful engineering problem solving program.
- Integrate HVAC design effort with other process improvement initiatives.

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COURSE OVERVIEW

ABSTRACT:
HVAC (heating, ventilation, and air conditioning) is the technology of indoor environmental comfort. HVAC system design is a sub-discipline of mechanical engineering, based on the principles of thermodynamics, fluid mechanics, and heat transfer. HVAC is important in the design of medium to large industrial and office buildings such as skyscrapers and in marine environments such as aquariums, where safe and healthy building conditions are regulated with respect to temperature and humidity, using fresh air from outdoors. New methods of modernization, higher efficiency, and system control are constantly introduced by companies and inventors worldwide. The three central functions of heating, ventilating, and air-conditioning are interrelated, especially with the need to provide thermal comfort and acceptable indoor air quality within reasonable installation, operation, and maintenance costs. HVAC systems can provide ventilation, reduce air infiltration, and maintain pressure relationships between spaces. The means of air delivery and removal from spaces is known as room air distribution. The starting point in carrying out an estimate both for cooling and heating depends on the exterior climate and interior specified conditions. However before taking up the heat load calculation, it is necessary to find fresh air requirements for each area in detail, as pressurization is an important consideration.

In modern buildings the design, installation, and control systems of these functions are integrated into one or more HVAC systems. Building services designers and engineers, such as mechanical, architectural, or building services engineers analyze, design, and specify the HVAC systems, and specialty mechanical contractors fabricate and commission them. Building permits and code-compliance inspections of the installations are normally required for all sizes of buildings.

TRAINING METHODOLOGY:

a) The latest educational methods and strategies will be utilized.
b) The course is designed to maximize delegate participation.
c) Questions and answers are encouraged throughout and at the daily wrap-up sessions. This gives participants the opportunity to discuss with others and the presenter their specific problems and appropriate solutions.
d) The course shall be conducted through lectures, case studies, group discussions and exercises to reinforce participant's learning.

TARGET AUDIENCE:

Design engineers, design technical assistants, draughting personnel, maintenance personnel, operational managers etc.

COURSE FORMAT:

The course consists of formal content presentation interspersed with content quiz sessions. The presenter's style involves intensive participant participation.

COURSE CONTENT

DAY-1

Introduction to HVAC System Design
- Air system design overview
- Airflow with constant volume systems
- Airflow with variable volume systems
- How Do You Balance Airflow?
- Best air delivery practices
- Air-side economizer
- Lower humidity limit
- A case study of two designs

Refrigeration & Air Conditioning
- Introduction
- Type of refrigeration
- Assessment of refrigeration and air-conditioning
- Energy efficiency opportunities

HVAC Equipment Overview
- Condenser
- Evaporator
- Expansion valve
- Compressor
- Air Handler
- Duct System
- Duct Design Problems

Function of an Air conditioner
- Principle
- Arrangement
- Types of Air-Conditioning Units
  a) Room Units
  b) Central Units
  c) Types of Centralised Units
  d)Large Units
  e)Sizing Air-Conditioning Units

DAY-2

Design of Indoor Air Quality Systems
- Recommended temperatures for acceptable relative humidity (RH)
- Outside air pollutants
- Damper operation
- Filters
  - Mechanical filters
  - Carbon filters
- Cooling coils
- Humidifiers
- Drain pans
- Air-Handling Units (AHU)
  - Single zone AHU
  - Multi-zone AHU
  - Dual duct AHU
  - Terminal reheat AHU
  - Variable air volume AHU

Complex HVAC Requirements
- Multiple Zone Air-side Systems
- Air-Side Economizers
- Controls (Air-Side, Complex Systems)
- Chillers
- Heat Rejection Equipment
- Hydronic Systems & Controls

Pump Design
- Condenser water pumps
- Chilled water pumps

Energy Savings in HVAC Systems
- A Case Study

Heat Pump Design
- What Is a Heat Pump?
- Basic types of heat pump cycles:
- Heat sources and sinks

Underfloor Air Distribution
- Introduction
- Goals and applications
- Revised load calculations
- Ventilation modifications
- Supply air quantities and temperatures
- System equipment
- Initial cost impacts
- Annual energy consumption and cost

Question &Answer Session
End of Workshop