



**MCP Academy**<sup>TM</sup>

Mechanical Construction Projects

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## Keep Learning To **Achieve Your Goals**

Construction On Line Training Program in the field of :

- **HVAC**
- **Fire Protection**
- **Plumbing (Water Supply and Drainage)**

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## WHO WE ARE ?

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## Vision

To be one of the most effective online trainings in technical and practical skills around Arabic and medial east counters for mechanical systems at construction building projects

## the message

Spreading knowledge and correct knowledge of mechanical building systems in construction projects in accordance with international standards and codes, and developing the skills of engineers in the Gulf countries and the Middle East to match the work requirements of major projects

## Objectives

Simplifying technical and practical information and gradual explanation of the content from theoretical to practical, drawing and then technical and design through recorded online lectures and interactive programs with trainees to ensure a correct and effective understanding of mechanical systems in the field of construction building projects

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## why us

Because we are the most specialized and have been working in the field for many years to work in the field of contracting in various positions and functional tasks as a contractor and consultant, supervision and technical support, where the content is provided through actual practical experiences for major projects implemented in the Arab world, and therefore we have the ability to support the trainee during and even after the end of the training program and the ability to Providing the necessary advice in the engineer's career path

## what we offer

We offer a recorded and interactive training program for mechanical construction systems in three parts, first theoretical and definitions, second part practical and drawing, and the third part technical and design, with the organization of interactive meetings with the trainees to follow up and support the content in various technical and engineering topics



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## Introducing of the lecturer engineer



Eng.Khaled Mohsen have many years of experience in the field of construction working as a contractor, consultant supervisor and technical support with high rise building and mega project at Egypt and Saudi Arabia Experience and Substantial Involvement in the Design, Design Review, Supervision, Inspection, Coordination and Review of Materials for a Wide Range of Mechanical Systems and Installations Related to Variety of Governmental Projects such as Hospitals and Industrial Facilities, Infrastructure Utilities, Mixed-use and Healthcare Complexes, Prestigious Developments and Hotels.

Certified as Professional Mechanical Engineer from Saudi Council of Engineers SCE-PE, Project and Risk Management Professional from Project Management Institute PMP®, PMI-RMP®, Leadership in Energy and Environmental Design LEED® Green Associate™

For more detail for my Project and professional experience kindly visit my website at LinkedIn:

<https://www.linkedin.com/in/eng-khaled-mohsen/>

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# HVAC System

## HVAC System Online Training Program

Our training program for HVAC system is based on the understanding and simple and sequential definition of the content parts to gradually raise the level of the trainee from beginning to professionalism, as what will be studied in the first part of theory and definitions are all components and parts of the system and their function of use, and the second part practical and drawing to study models of large projects for installations, implementation on the site, then In the third technical and design part, the calculation of loads will be studied using the HAB program, also we supported our trainer with material summaries resources which will help the engineer during and after the study.



# What you will learn ?

The participant will be trained in the first part of the theoretical and definitions by identifying all the parts and components of, HVAC System, ducting installation and all of its component and accessories, chilled water piping networks and installation works, part two practical and drawing Training is given to read and know the implementation drawing of the project and the important basics of installations for the executive engineer and consultant by presenting registered projects from the reality of the professional and practical experiences of the lecturer engineer, part three technical and design calculate HVAC loads and system design, explain the HAP program, know and understand the important basics that must be considered during the design of the central air conditioning system

# HVAC System Online Lectures Overview

## ■ Part- 1 Theoretical and Presentation

### LEC 1 HVAC Equipment System Component

(LEC Duration: 50 min )

In this lecture, we will explain Refrigeration Cycle and define the HVAC System Component, Different Chiller Types (air and water-cooled), Cooling towers, Heat Exchangers, and different types of AHU - Air Handling Units

### LEC 2 Follow HVAC Equipment System Component

LEC Duration: (60 min )

At this lecture, we will explain Ton Refrigerator and its Definition, AHU Filter Type, MERV Definition, function and working principle for Sand Trap Louver, Steam Humidifier, and Dehumidifier, Chilled Water Pump and method of pump loop connection, define different Types of Exhaust Fan and explain Variable Air Volume VAV, Constant Air Volume CAV and identify different Type of Anti Vibration Isolator

### LEC 3 HVAC Ducting Work Material and Installation LEC

Duration: ( 60 min )

In this lecture, we will define Different types of Duct materials and their Method of Connection, Duct Installation and Different Types of duct Insulation, Type of dampers and its function (Manual and Control Volume Damper, Manual Fire Damper, and Motorized Fire Smoke Damper), Different type of air outlet Diffuser and grille, function and uses of Flexible air and flexible duct connector, Sound Attenuator (silencers)

### LEC 4 HVAC Chilled Water System LEC Duration: (40 min )

In this lecture, we will Explain chilled water Piping Connection and Installation, Piping Insulation, and Cladding, and define different types of Flow System design.

### LEC 5 HVAC Chilled Water System LEC Duration: ( 45 min )

Explain all the Hook-Up Valves components and their function for HVAC equipment (Chiller, Pump, AHU, FCU), Structural Expansion Joint, Expansion Tank and Air separator, and Type of Balancing and System Control.

### Part 2- Practical and Drawings

#### LEC 1 LEC 1 HVAC Ducting Hospital Project

(LEC Duration: 80 min)

In this lecture we will read ducting drawing for Hospital Project (700 Bed /6 Floors) and we will explain Duct coordination and installation, Duct size and duct weight calculation and Duct inspection and smoke test

#### LEC 2 Follow HVAC Ducting Hospital Project (700 Bed)

(LEC Duration: 50 min)

At this lecture, we will follow to read ducting drawing for Hospital Project (700 Bed /6 Floors) and we will explain AHU Installation and inspection, Smoke Extracting System, Stair Case Pressurization System

#### LEC 3 Chilled Water System Hospital Project (700 Bed)

(LEC Duration: 60 min)

At this lecture, we will read chilled water drawing for Hospital Project (700 Bed /6 Floors) and we will explain Chilled Water Riser valves, Installation, and Inspection for Fan Coil Unit FCU, Chiller Installation.



## ■ LEC 4 Follow Chilled Water System Hospital Project (700 Bed)

(LEC Duration: 60 min)

At this lecture, we will follow to read chilled water drawing for Hospital Project (700 Bed /6 Floors) and we will explain Chilled water flow rate and balancing, Chiller inspection, Chilled water pump room, and pre-insulated pipe



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## ■ Part - 3 Technical and System Design

### LEC 1 Ventilation and load calculation (LEC Duration: 30 min)

At this lecture we will learn how to calculate Ventilation air Flow Rate then we will start with HVAC Load calculation and capacity by HAP (Hourly Analysis Program)

### LEC 2 Follow load calculation by HAP LEC Duration: (40 min )

At this lecture, we will follow to learn how to calculate HVAC Load calculation and capacity by HAP (Hourly Analysis Program)

### LEC 3 HVAC HAP Design for Hospital Tower 400 Bed LEC

Duration: ( 45 min )

In this lecture we will study HVAC Load and design calculation for hospital tower which contain number of 400 bed and 13 floor using HAP program

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# Fire Protection System

## Fire Protection System Online Training Program :

Our training program for Fire Protection system is based on the understanding and simple and sequential definition of the content parts to gradually raise the level of the trainee from beginning to professionalism, as what will be studied in the first part of theory and definitions are all components and parts of the system and their function of use, and the second part practical and drawing to study models of large projects for installations, implementation on the site, then In the third technical and design part, the calculation of Sprinkler system by studying design criteria and requirement as per NFPA then we will study the calculation using elite fire program



# What you will learn ?

The participant will be trained in the first part of the theoretical and definitions by identifying all the parts and components of sprinkler System piping installation and all of its component valves and accessories, we will define other different method of fire suppression system ( Foam, FM 200 , WATER MIST , NOVEC ,CO2) for the systems component and its application , part two practical and drawing the participant is given to read and know the implementation drawing of the project and the important basics of installations for the executive engineer and consultant by presenting registered projects from the reality of the professional and practical experiences of the lecturer engineer, part three technical and design to study fire sprinkler system concept of design and calculation by fire elite program .

# Fire Protection Online Lectures Overview :

## ■ Part1- Theoretical and Presentation

**LEC -1 Sprinkler System Component (LEC Duration: ( 40 MIN)**

In this lecture, we will explain the Type of Sprinkler, Zone Control Valve Components (OS&Y Valve, Flow and Tamper Switch, test and drain valve), Alarm check valve, air vent, type of Fire Hose

**LEC -2 Follow Sprinkler System Component (LEC Duration: 40 min)**

In this lecture we will explain Standpipe Riser System, Fire Department Landing Valve, Siamese Connection and Fire Hydrant, Dry Piping Sprinkler System, Pre-Action System, Deluge Valve, Fire Pumps

### LEC -3 Fire Exchangers and Clean Agent

(LEC Duration: 45 MIN)

In this lecture we will explain different type of Portable fire exchanger, CO2 System, Clean Agent (FM 200, NOVEC), Foam System Component and application, Kitchen Hood, Water Mist System, Fire Alarm Systems, Pressurization and Smoke Control System

### LEC -4 Smoke Control and Fire Alarm Systems

(LEC Duration: 25 min )

In this lecture, we will explain some of the Fire Alarm Systems components, Pressurization, and Smoke Control System



### Part 2- Practical and Drawings

#### LEC 1 High Rise Building Hospital Tower Project 480 Bed

( LEC Duration : 40 min)

#### LEC 2 Follow High Rise Building Hospital Tower Project 480 Bed

(LEC Duration 40 min)

In this tow lectures, we will be Reading the main building drawing (Legend & Riser Diagram & Plan Drawing) for High Rise Building Surgical Hospital Tower (480 Bed /14 Floors) and we will explain the Building Hazard Classification, Helipad Fire Fighting Method, Electrical and server room firefighting, all sprinkler system valves and detail component.

#### LEC 3 Utilities Building for high rise hospital tower project (LEC Duration 35 min)

In this lecture, we will Read the utilities Building firefighting sprinkler system riser diagram and plan drawings, fire water tank, Pump Room, equipment schedule drawing, generator, and fuel pump room method of fire protection, define UL, and FM listed.

## LEC 4 Smoke Control System for Hospital Tower 480 Bed

(LEC Duration 50 min)

In this lecture, we will Reading Drawing smoke extracting system for High Rise Building Hospital Tower (Patient Room Bed – 480 Bed /14 Floors), Fire damper and its function and installation, Smoke fan calculation

### Part - 3 Technical and System Design :

#### LEC 1 Sprinkler System Design Criteria as per Code and Standard (LEC Duration 45 min)

In this lecture we will learn Hazard Classification as per building and occupancy, Sprinkler Distribution, Fire Piping Diameter, Friction Losses Calculation, Node Analyses definition, Design operation area



#### LEC 2 Follow Sprinkler System Design Criteria as per Code and Standard (LEC Duration 45 min)

In this lecture we will learn Design Density  $D_d$ , K-Factor (percent between flow rate and pressure at sprinkler), Minimum and Maximum Operation Pressure for Sprinkler System, Balancing Nodes, System Flow Rate, Minimum Residual Pressure for Stand Pipe System, Pump Capacity Calculation, Stand Pipe Riser Drain, Fire Department Connection, Maximum allowable Water Velocity, Water Supply Duration Requirement .



# Plumbing - Drainage and Water Supply System

## Plumbing - Drainage and Water Supply System Online Training Program :

### Description:

Our training program for Plumbing water supply and drainage is based on the understanding and simple and sequential definition of the content parts to gradually raise the level of the trainee from beginning to professionalism, as what will be studied in the first part of theory and definitions are all components and parts of the system and their function of use, and the second part practical and drawing to study models of large projects for installations, implementation on the site, then In the third technical and design part, the calculation of drainage piping size and reading International plumbing code for important requirement and design criteria

## What you will learn ?

The participant will be trained in the first part of the theoretical and definitions by identifying all the parts and components of water supply and drainage system and different piping type for its installation and function of use , part two practical and drawing the participant is given to read and know the implementation drawing of the project and the important basics of installations for the executive engineer and consultant by presenting registered projects from the reality of the professional and practical experiences of the lecturer engineer, part three technical and design to study drainage system pipe sizing and reading for the most technical and design criteria requirement from international plumbing code .



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## Plumbing - Drainage Online Lectures Overview :

### ■ Part1- Theoretical and Presentation

#### LEC -1Drainage System Component (LEC Duration: 45 min)

In this lecture we will define Different type of Drain for its function and Installation and Different types of drainage fixture, External manholes and Sump Pit, Types of Drainage Interceptor and its function of uses, Chemical Waste Requirement .

#### LEC -2Drainage Piping Installation (LEC Duration: 25 min)

In this lecture, we will define Different types of piping material and their method of connection, Piping Installation (Supporting & Slope) Different types of drainage systems, and Storm Drainage networks and its Requirement.

### ■ Part 2- Practical and Drawings

#### LEC -1Drainage Projects Drawing (Housing + High Rise Building Hospital Tower) (50 min)

First, in this lecture, we will start with Reading Drainage Housing Projects for both (one pipe & and tow pipe) system concepts and then we will Read Project drawing (Legend & Riser Diagram & Plan Drawing) for High Rise Building Surgical Hospital Tower (480 Bed /14 Floors) and we will explain the Special Drainage Requirement for Chemical Waste

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## LEC -2-2 Practical and Theoretical Review

(LEC Duration:30 min)

At this lecture we will review the Theoretical and Practical for some drainage items by including both in one presentation slide, also we will mention the Most common notes for contractor and consultant site work.

### ■ Part - 3 Technical and System Design

LEC -1 Pipe Size Calculation (LEC Duration:15 min)

At this lecture, we will learn how to calculate the Drainage system and storm Pipe Size .

## Plumbing – Water Supply Online Lectures Overview :

### ■ Part- 1 Theoretical and Presentation

LEC -1 Water Supply System Component (LEC Duration:55 MIN)

In this lecture, we will define Different types of Valves and their function, Types of Fixture Faucets, and different types of Water Heater, Tanks, and Pumps and we will explain the Water Hammer Phenomenon and the function of the Water Hammer Arrestor.

LEC -2 Water Supply Piping Material and Installation

(LEC Duration:24 MIN)

In this lecture, we will define Different Types of Piping Material and their Method of Connection, Piping Support and Installation Method of Hot Water Piping Insulation, External Piping Installation, and Thrust Block and Method Valves Installation.

### ■ Part 2- Practical and Drawings :

LEC 1 Water Supply Housing Projects Drawing

(LEC Duration 25 MIN)

In this lecture, we will Read the Difference housing project concept of design and clarify the different methods of the Hot Water System.



## LEC 2 High Rise Building Hospital Tower Project Drawing

(LEC Duration:55 MIN)

First, in this lecture, we will start with Reading the main building drawing (Legend & Riser Diagram & Plan Drawing) for High Rise Building Surgical Hospital Tower (480 Bed /14 Floors), and we will read the Utilities Building Drawing for Pump Room and Boiler Room, Heat Exchanger System for Hot Water Supply

### ■ Part - 3 Technical and System Design

#### LEC 1 IPC Reading for Important Information

(LEC Duration 45 min )

#### LEC 2 IPC Reading for Important Information

(LEC Duration 45 min)

#### LEC 3 IPC Reading for Important Information

(LEC Duration 45 min )

Explain and Read International Plumbing Code IPC during three lectures for some of the important subjects which support all our plumbing training programs



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