



MU285: Air Conditioning

Training Description:

This training course is a practical introduction to design of air conditioning systems. It looks at such aspects of design as vapour compression cycles; heat transfer in two-phase flow; types, selection and operation of refrigeration plant; psychometrics; climatic data and its use; load estimation and analysis; constant and variable air volume systems; human comfort and health; cooling and dehumidifying coils; controls; fans and duct systems; system balancing and stimulation; energy efficiency in buildings.

Training Objectives:

By the end of the training, participants will be able to:

- ✓ Explain of the principles of air conditioning design, and consideration that influence the design including human comfort, weather and environmental parameters and building structure
- ✓ Apply basic design skills to be able to estimate life-cycle costing and choose the right type of system
- ✓ Explain load estimation and analysis, psychometric analysis of a system and climate data and its use
- ✓ Explain plant design, choosing plant components and understanding their characteristics and operating modes
- ✓ Define and describe computational methods used in air conditioning design
- ✓ Demonstrate analytical cognitive skills and improve problem solving skills in air conditioning
- ✓ Demonstrate the ability to work effectively as part of a team; and
- ✓ Write a technical report.

Training Designed for:

This course is intended for Engineers and other professionals involved in installation, operation, maintenance or repair of Air conditioning systems.

Training Requirement:

“Hand’s on practical sessions, equipment and software will be applied during the course if required and as per the client’s request.”

Contents can be adapted to your specific wishes. It is therefore possible to focus on specific modules of the training course as per client’s learning needs and objectives. Further, it should be forwarded to us a month prior to the course dates.

Training Program:

FIVE DAYS:

❖ Introduction to Air-conditioning Systems

- Definitions
- Complete systems
- A/c and distribution systems
- All-air systems
- Air-and-water systems
- Induction systems
- All-water systems



- Unitary air conditioners
- Heat pumps
- Heat recovery systems
- Thermal storage
- ❖ **Psychrometrics**
 - Psychrometric chart
 - Basic processes
- ❖ **Design Conditions**
 - Physiological principles
 - Design conditions
- ❖ **Solar Heat Gain**
 - Properties
 - Polar angles
 - Heat gain through fenestration
 - Shading devices
- ❖ **Heating Load Calculations**
 - Heat losses
 - General procedure
 - Selecting heating design conditions
- ❖ **Cooling Load Calculations**
 - Heat flow rates
 - Heat balance fundamentals
 - Initial design considerations
 - Heat gain calculation concepts
 - Heat sources in conditioned spaces
- ❖ **Energy Estimating Methods**
 - Energy estimating methods
 - Overall modelling strategies
 - Integration of system models
 - Degree-day methods
- ❖ **Compressors, Expansion Devices and Refrigerants**
 - Reciprocating compressors
 - Rotary screw compressors
 - Vane compressors
 - Centrifugal compressors
 - Expansion devices
 - Refrigerants
- ❖ **Condensers and Evaporators**
 - Terminology
 - Cooling and dehumidifying coils
 - Condensers and evaporators
 - Cooling towers
- ❖ **Fans, Ducts, Pumps and Piping**

- Fans – characteristics, performance, selection and installation
- Ducts – pressure drop, design and optimization
- Pumps
- Piping – water and refrigerant
- ❖ **Air-conditioning software**
 - Computer training
- ❖ **Industrial visit (optional)**
 - Practical aspects of a/c design
 - Modern Topics in Air conditioning
- ❖ **Specific Course Requirements**
- ❖ **Laboratory (Optional)** - This course includes laboratory involving working in a team collecting and analyzing air conditioning data
- ❖ **Course Conclusion**
- ❖ **POST-ASSESSMENT and EVALUATION**

Training Methodology:

This interactive training course includes the following training methodologies as a percentage of the total tuition hours:

- 30% Lectures, Concepts, Role Play
- 70% Workshops & Work Presentations, Techniques, Based on Case Studies & Practical Exercises, Gamification, Software & General Discussions
- Pre and Post Test

Training Certificate(s):

CMCT Internationally recognized certificate(s) will be issued to each participant who completed the course.

Training Fees:

TBA as per the course location - This rate includes participant's manual, hand-outs, buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

Note: The 5% VAT (Value Added Tax), will be effective starting 01st of January 2018 as per the new regulation from the UAE Government. The VAT applies for all quotation both for local and abroad.

Training Timings:

Daily Timings:

07:45 - 08:00	Morning Coffee / Tea
08:00 - 10:00	First Session
10:00 - 10:20	Recess (Coffee/Tea/Snacks)
10:20 - 12:20	Second Session
12:20 - 13:00	Recess (Prayer Break & Lunch)
13:00 - 14:00	Last Session

For training registrations or in-house enquiries, please contact:

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