



## **2 Day`s Training program on**

### **HVAC SYSTEMS: DESIGN, OPERATIONS & MAINTENANCE**

**7-8 December at Kolkata**

#### ***Training Program Objective and Description:***

With the increase in global competition and awareness about energy conservation and management new concepts such as Green Buildings and District Cooling have emerged as an essential development.

HVAC & R (Heating, Ventilation, Air Conditioning, and Refrigeration) systems are the back bone in all industries including Oil & Gas, Petrochemical, Power, Chemical, Water, Waste Water, Pharmaceuticals, Process, Food & Beverages etc.

This is an introductory course to provide exposure to the basic concepts of HVAC Design, Engineering, Operations and Maintenance. It will enhance the theoretical as well as practical concepts related to Heating, Ventilation and Air Conditioning Systems (HVAC). Basics of Electrical and control devices relevant to the HVAC systems are also covered.

The program also covers energy auditing and conservation in HVAC systems including Energy Saving Opportunities etc.

#### ***Upon completion of this course the participant will be able to:***

- Understand fundamentals of HVAC systems
- Learn HVAC Design Fundamentals
- Know importance of Air Quality
- Learn the Cooling Systems
- Understand the Air Ventilation Systems
- Learn the Design, Selection, Operations and Maintenance of HVAC systems
- Get the insight to the design philosophy behind an HVAC system which will help them not only in proper maintenance of the equipment but also will enable them to do the proper selection of the applicable HVAC system and sizing of its main components. In addition they will be able to identify energy saving opportunities in the systems they maintain.



## *Who Should Attend?*

All practicing Engineers, DET, GET, O&M professionals; others who willing to get knowledge regarding mechanical maintenance.

## *Program Contents:*

- Introduction
- History of HVAC, HVAC Fundamentals, HVAC Systems: Low Side & High Side
- Different type of air-conditioning methods (Chiller, Ductable, Package, Split, VRF)
- HVAC Design Basics
- Heat load calculations and selection for HVAC units
- Selection criteria of different air-conditioning methods
- Psychometric charts for HVAC
- Heating and de-humidification process in HVAC system
- Evaporators, Absorbers, Condensers, Compressors, Chillers, Cooling Towers
- Equipment for Cooling source
- Selection of Cooling Equipment – Use of different refrigerants
- Operation & Maintenance Of Cooling Equipment
- Equipment for Ventilation source
- Selection of Ventilation Equipment
- Operation & Maintenance Of Ventilation Equipment
- Importance of Air Quality- effect on Humans, Process & Machinery
- Environmental Impact due various equipment / material used HVAC Systems
- Special coverage on sustainability points for HVAC - materials , heat load optimization , day lighting , ducting arrangement , refrigerant for chiller , heat recovery options , CO2 monitoring etc.
- Electrical major items related to HVAC systems e.g. Electric Motors, VFD etc.
- Control systems in HVAC
- Points to be taken care during erection / installation / commissioning
- Commissioning tests
- PM methods / frequency / check points
- Energy saving opportunities in HVAC Systems – In Building Heat load minimization
- In process heat load minimization and at the Refrigeration and Air conditioning plant areas.



# Centre For Industrial Solution and Advanced Training

AN ISO 9001:2015 CERTIFIED

(Technical- Electrical/Mechanical/Automation/Chemical, Behavioral & Soft Skill, Safety, Business Excellence, Safety & Energy Audit)

“A complete Training Solution Under One roof”

- Latest innovation for energy savings in air conditioning

Post Course Test

CASE STUDIES: REAL LIFE APPLICATIONS WILL BE PRESENTED

**Certification:** Every successful participant will be awarded a course completion certificate.

## Delivery Methodology (Strategy):

- Introduction and Objective Setting
- Pre and Post Test,
- Knowledge Presentations,
- Assignments & Exercise,
- Feedback and Assessment
- Discussion and Interaction
- Delivery 9:30 AM to 17:30 PM

## About CISAT:

Centre For Industrial Solution and Advanced Training is an ISO 9001:2015 certified Training Provider Company managed by professionals with rich Industry and teaching experience. Company involves in professional trainings and been providing training on various topics of Industry interest through various experts associated. More details are available on [www.cisat.co.in](http://www.cisat.co.in).

## Registration:

**Dates of the program:** 7-8 Dec (Thursday- Friday) 2017 at Kolkata.

**Participation fees:** INR 18000/- per delegate (Excluding GST@18%; Training program includes training material hard copies, Tea, Lunch & snack, excluding lodging and Boarding)

**Payment:** ECS/NEFT/DD in favor of “Centre for Industrial Solution and Advanced Training” Payable at Nagpur, Maharashtra, India. Account No: 0509102000003353



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Bank: IDBI, Wardha- 442001, MS, India; IFSC Code: IBKL0000509; Swift Code IBKLINBB007; MICR Code 000259000.

**Venue:** Kolkata (to be informed before 7 days of training commencement).

**For Registration please do contact to,**

We prefer on line Registration through our web [www.cisat.co.in](http://www.cisat.co.in).

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**Contact for any In-house Training Program at your plant or location.**

**Centre For Industrial Solution and Advanced Training**

Web: [www.cisat.co.in](http://www.cisat.co.in); Email: [cisat.nagpur@gmail.com](mailto:cisat.nagpur@gmail.com) ; Contact: +91- 7709012815; 8669546332  
(GST Code:27ABBPW5589J1ZV; SAC Code 99-9293; State Code 27; PAN No: ABBPW5589J)

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