Best Technology Soultions **(BTS)**

Training Program

Codes & Standards Of HVAC Equipment & Systems

Training Program

Introduction:

Understanding codes & regulations governing design, maintenance & operation of HVAC Equipment and Systems is a must for all individuals who have interest in and working with HVAC systems. Proper design and operation of HVAC Equipment and Systems not only requires a thorough understanding of relevant codes and standards, but also it requires one to stay up-to-date with all frequent changes introduced in these codes and standards. This course focuses on enabling participants to be knowledgeable with heating, ventilation and air conditioning systems with respect to requirements of Environmental Separation and Heating, Ventilation and Air Conditioning of the Provincial Building Code. The course also covers information on applicable standards referenced in these codes such as ASHRAE standards 55, 62.1, & 90.1. Case studies and workshops will be used to explore the prescriptive compliance options and the performance compliance options available in these codes and standards. Recent changes introduced in these codes & standards and their implications on the design & operation of HVAC Equipment and Systems will also be addressed. The course will feature:

- Psychrometric representation and analysis of commonly used HVAC cycles
- Overview of various HVAC systems
- Building code sections pertain to HVAC systems
- Codes and standards applicable for design and operation of HVAC systems
- ASHRAE standard 55 - thermal environmental conditions for human occupancy
- ASHRAE standard 62.1 - ventilation for acceptable indoor air quality
- ASHRAE standard 90.1 - energy standard for buildings except low-rise residential buildings

Who Should Attend?

Mechanical Engineers, General Supervisors, Consulting Engineers, Design Engineers, Foremen, Supervisors, Technicians, Maintenance Personnel, Engineers of all disciplines, Supervisors, Team Leaders and Professionals in Maintenance, Engineering and Production Managers, Maintenance Personnel, Heads of Maintenance and Operation, Chemical Engineers, Equipment Specialists, Technical Engineers, Operation Engineers, Planning Engineers, Process Engineers, Reliability Specialists, Boiler Plant Construction Managers, Consulting Engineers, Design Engineers, Insurance Company Inspectors, Operation, Maintenance, Inspection and Repair Managers, Supervisors and Engineers, Plant Engineers, Senior Boiler Plant Operators, Repairers and Installers, Project Engineers and Technologists, Facility Engineers, Consultants, Mechanical Engineers and Technologists, Maintenance and Operation Personnel and other technical personnel who need to upgrade/refresh their current knowledge of HVAC systems

Course Objectives:

By the end of this course, delegates will be able to:

- Identify & understand recent changes introduced in the codes/standards & their implications on the design & operation of HVAC equipment & systems
- Plan & design HVAC equipment & systems in compliance with applicable codes & standards
- Identify & Select procedures for efficient operation of various HVAC equipment & systems
- Understand which compliance option is most suitable for a given circumstance
- Identify regulations which pertain to your own specific situation
- Gain insight into how to modify/adjust current systems in order to comply

Course Outline:

Psychrometric Representation and Analysis of Commonly Used HVAC Cycles

- A quick review of the Psychrometric chart and Psychrometric processes
- A Typical summer air conditioning cycle without humidity control
- A Typical summer air conditioning cycle without humidity control
- A Typical winter air conditioning cycle

- Calculation of required equipment capacity and required supply air

An Overview of Various HVAC Systems

- Types of HVAC systems
- Centralized air systems
- Partially centralized air/water systems
- Local systems
- Natural and mechanical ventilation
- Ventilation and air conditioning selection

Building Code Sections pertain to HVAC Systems

- Introduction – scope and objectives
- Code structure
- Division B – Part 5- environmental separation
- Division B – Part 6- heating, ventilation, and air conditioning

Codes and Standards Applicable for Design and Operation of HVAC Systems

- ASHRAE standard 55 - thermal environmental conditions for human occupancy
- ASHRAE standard 62.1 - ventilation for acceptable indoor air quality
- ASHRAE standard 90.1 - energy standard for buildings except low-rise residential buildings

ASHRAE Standard *55*

- Purpose
- Scope
- Definitions
- General requirements
- Conditions that provide thermal comfort
- Compliance and sample compliance documentation

- Evaluation of the thermal environment

ASHRAE Standard 62.1

- Purpose
- Scope
- Definitions
- Outdoor air quality
- Systems and equipment
- Ventilation air distribution
- Exhaust duct location
- Ventilation system controls
- Outdoor air intakes
- Exfiltration
- Finned-tube coils and heat exchangers
- Humidifiers and water-spray systems
- Building envelope and interior surfaces
- Air classification and recirculation
- Procedures
- Ventilation rate procedure
- IAQ procedure
- Natural ventilation procedure
- Exhaust ventilation
- Construction and system start-up
- Operations and maintenance
- Calculation of ventilation efficiency for multiple-zone systems
- Application, compliance and documentation

ASHRAE Standard 90.1

- Purpose

- Scope
- Definitions, abbreviations & acronyms
- Administration & enforcement
- Compliance approaches
- New buildings
- Existing buildings
- Alternative materials, construction methods, or design
- Compliance documentation
- The compliance and enforcement process
- Building envelope
- General design considerations
- Mandatory provisions
- Prescriptive option
- Trade-off option
- HVAC systems
- General information
- Simplified approach
- Mandatory provisions
- Prescriptive path
- Compliance forms
- Part I: simplified approach
- Part II: mandatory provisions
- Part III: prescriptive requirements

Assessment of Building Envelop and HVAC System Compliance with ASHRAE Standard 90-1

- Service water heating
- General information
- General design considerations
- Mandatory provisions

- Prescriptive requirements
- Compliance forms
- Lighting
- General design considerations
- Mandatory provisions
- Interior lighting power
- Compliance forms
- Power
- General information
- Mandatory provisions
- Submittals