

HVAC Fundamentals

This five-day course covers the design, construction, operation, and maintenance associated with air conditioning and refrigeration units. Special attention is placed on the environmental concerns associated with commonly used refrigerants, as well as the recent restrictions placed upon the handling and disposal of these refrigerants by the EPA in accordance with the Clean Air Act. This course is designed for all maintenance personnel involved in the upkeep and repair of air condition units as part of their daily routine.

I. Properties of Matter

- Molecular Theory
- States of Matter
- Heat Transfer

II. Gases

- Expansion
- Gas Laws
- Densities and Specific Volumes
- Gas Mixtures

III. Air Conditioning

- Definition
- Properties of Air
- Using the Psychometric Chart
- Measuring Air Movement

IV. Refrigerants

- Characteristics
- Types
- Properties
- Moisture Effects
- Oil Effects
- Leak Detection
- Performance
- Storage

V. Refrigerant Oils

- Classification
- Properties
- Specifications

VI. System Components

- Vapor Compression Cycle
- Compressors
- Condensers
- Evaporators
- Receiver
- Flow Controls

VII. Auxiliary Components

- Piping
- Separators
- Filters
- Mufflers
- Moisture Indicators
- Valves

VIII. Chiller Controls

- Types of Control Systems
- Automatic Controls
- Adjustments

IX. System Operation

- Normal Operation
- Abnormal Operation

X. Maintenance and Troubleshooting

- Troubleshooting Techniques
- Performance Evaluations
- Equipment Use