

## Air Conditioning and Refrigeration

Air Conditioning and Refrigeration is a five-day, lecture-based course that covers the basic mechanical refrigeration cycle, the different refrigerants available, major refrigeration system components, and system operation. The portion of the course on air conditioning deals mainly with air conditioning service techniques. This is a technician-level course for both operating and maintenance personnel, providing the knowledge base necessary to begin working on the equipment and to get the most out of equipment-specific training.

### I. Matter and Heat Behavior

- Motion of Molecules
- Changes of State
- Measuring the Amount of Heat Energy
- Removing Heat - Cooling
- Conservation of Energy
- Heat Flow
- Refrigeration Effect - "Ton"

### II. Fluids and Pressures

- Expansion of Gases
- Gas Laws
- Density of Materials
- Specific Volumes of Materials
- Mixtures of Gases

### III. Refrigerants

- Refrigerant Characteristics
- Refrigerant Properties
- Refrigerants and Water
- Leak Detection
- Effect on Materials
- Refrigerant Performance
- Refrigerant Storage
- Refrigerant Safety Precautions

### IV. Refrigeration System Components

- Basic Mechanical Refrigeration Cycle
- Compressors
- Condensers
- Refrigerant Flow Controls
- Evaporators

### V. Refrigeration Piping and Accessories

- Refrigeration Piping
- Hot Gas, Liquid, and Suction Lines
- Types of Accessories
- Valves

### VI. Refrigeration Oils

- Classification
- Properties
- Oil Specifications

### VII. Air Conditioning

- Definition of Air Conditioning
- Air-Atmosphere
- Physical Properties of Air
- Psychrometric Properties of Air
- Air Movement

## **VIII. Air Conditioning Service Techniques**

- Installing a Gauge Manifold
- Gauge Manifold
- Evaluating Performance of System
- Removing Refrigerant
- Open and Make Repairs
- Pressure Testing
- Evacuating a System
- Charging a Repaired System
- Evaluate Repair