

Refrigeration Systems

This five-day, lecture-based course covers the basic mechanical refrigeration cycle, the different refrigerants available, major refrigeration system components, system operation, service, and troubleshooting. This is a technician-level course for both operating and maintenance personnel, providing the knowledge base necessary to work on refrigeration equipment.

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