

ATSM-2420: REFRIGERATION II

Cuyahoga Community College

Viewing: ATSM-2420 : Refrigeration II

Board of Trustees:

2012-05-24

Academic Term:

Fall 2018

Subject Code

ATSM - Applied Ind Tech- Sheetmetal

Course Number:

2420

Title:

Refrigeration II

Catalog Description:

Covers the components of refrigeration systems, applications to air conditioning and the use of specialty tools including vacuum pumps and gages. Installation methods, maintenance and troubleshooting are also covered.

Credit Hour(s):

2

Lecture Hour(s):

2

Requisites

Prerequisite and Corequisite

Departmental approval: admission to Sheet Metal Worker's apprenticeship program.

Outcomes

Course Outcome(s):

Identify the components of refrigeration systems used in residential air conditioning systems.

Objective(s):

1. Describe common types of metering devices.
2. Compare various types of compressors that are used in cooling systems.
3. Distinguish the differences between various evaporator and condenser coils.
4. Discuss the purpose of safety controls that are used with air conditioning systems.

Course Outcome(s):

Describe how refrigeration relates to air conditioning.

Objective(s):

1. Explain structural heat gain/loss.
2. List the ways heat transfer occurs.
3. Discuss how high efficiency in air conditioning is accomplished.
4. Differentiate between packaged air conditioning and split system units.

Course Outcome(s):

Assemble components of refrigeration systems.

Objective(s):

1. Select the proper tools and equipment needed for installation.
 2. Layout tubing and ductwork locations.
 3. Install components and connecting tubing.
 4. Apply leak checks and evacuating test to the system.
 5. Connect the required electrical power and control wiring for the system.
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Course Outcome(s):

Maintain refrigeration systems by employing instrument checks and troubleshooting procedures.

Objective(s):

1. Select the correct instruments for checking air conditioning systems having mechanical problems.
 2. Calculate correct operating pressures for standard and high efficiency refrigeration units.
 3. Diagnose and correct basic electrical problems using various troubleshooting methods.
 4. Identify mechanical problems generally found in compressors, condensers and evaporator coils.
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Methods of Evaluation:

1. Tests
2. Quizzes
3. Class participation

Course Content Outline:

1. Component Identification
 - a. Metering Devices
 - i. Thermostatic
 - ii. Capillary Tube
 - iii. Fixed Bore
 - b. Compressors
 - i. Scroll
 - ii. Reciprocating
 - iii. Rotary
 - c. Coils
 - i. Evaporator
 - ii. Condenser
 - iii. Differences
2. Refrigeration and Air Conditioning
 - a. Heat gain
 - i. Structural
 - ii. Residential
 - b. Heat Transfer
 - i. Solar
 - ii. Infiltration
 - iii. Conduction
 - c. Heat Efficiency
 - i. Condenser coil
 - ii. Compressor
 - iii. Operating pressures
 - d. Types of Air Conditioning
 - i. Packaged
 1. Self contained
 2. Pre charged
 - ii. Split System
 1. Requires piping
 2. Component connections
 3. Refrigeration charge
3. Component Assembly

- a. Layout
 - i. Tubing locations
 - ii. Duct fittings
 - iii. Transitions
- b. Tool selection
 - i. Specialty hand tools
 - ii. Vacuum pumps
 - iii. Brazing alloy
- c. Component Installation
 - i. Tubing
 - ii. Coils
 - iii. Condenser unit
- d. System Testing
 - i. Tubing connections
 - ii. Leak checks
 - iii. Tubing evacuation
- 4. Maintenance and Troubleshooting
 - a. Instrument Selection
 - i. Meters
 - ii. Gages
 - iii. Thermometers
 - b. Operating Pressures
 - i. Calculations
 - ii. Balancing
 - iii. Temperature Pressure Relationship
 - c. Electrical problems
 - i. Test
 - ii. Amperages
 - iii. Voltage
 - iv. Connections
 - d. Mechanical Problems
 - i. Condensers
 - ii. Compressors
 - iii. Evaporators

Resources

International Training Institute. *Core Curriculum*. 2nd. International Training Institute Alexandria, Va., 2004.

International Training Institute. *Sheet Metal Math*. 2nd. International Training Institute Alexandria, Va., 2007.

International Training Institute. *Layout Curriculum*. 1st. International Training Institute Alexandria, Va., 2010.

Author: Dick Wirz. *Commercial Refrigeration for Air Conditioning Technicians*. 2nd Edition. cengege publishers Stamford, Connecticut, 2010.

Resources Other

- www.archive.org/details/powerspractical00unkngoog -
- [www.amazon.com/\(http://www.amazon.com/Refrigeration...Bill.../dp/1401837654/\)Refrigeration...Bill.../dp/1401837654](http://www.amazon.com/(http://www.amazon.com/Refrigeration...Bill.../dp/1401837654/)Refrigeration...Bill.../dp/1401837654)
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Top of page

Key: 709