

### **Lesson 1 - Introduction to the Concept of Heat**

Objectives:

- Describe heat and energy relationships.
- Define a Btu and explain its importance.
- Explain the difference between sensible heat and latent heat.
- Explain the four methods of heat transfer.
- State the law of conservation of energy.

### **Lesson 2 - Principles of Heating**

Objectives:

- Measure temperatures using Fahrenheit and Celsius scales.
- Convert Fahrenheit to Celsius and Celsius to Fahrenheit.
- Describe steam principles and characteristics.
- Explain the difference between absolute pressure and gauge pressure.
- Use heating terminology correctly.

### **Lesson 3 - Principles of Heat Flow**

Objectives:

- Determine what “comfort conditions” are.
- Identify the factors that control human comfort.
- List the four methods of heat transfer.
- Describe the effect that air movement has on comfort.
- Explain why relative humidity is important.
- Identify the various ways that heat is delivered.
- Explain the effect of temperature swings.
- Define the conductivity of various substances.

### **Lesson 4 - Heat Loss from Structures**

Objectives:

- Calculate the heat loss from a structure.
- Explain the importance of ventilation.
- Explain how to reduce heat loss.
- Describe how to insulate a house properly.

### **Lesson 5 - Review of Fundamentals of Heat Load Calculation**

Objectives:

- Explain the difference between conductivity and resistance
- Calculate the heat loss of a house.
- Use heat transfer multipliers.
- Determine infiltration load.

### **Lesson 6 - Ducted Warm Air Systems/Room Air Distribution**

Objectives:

- Recognize various duct designs.
- Explain what criteria to use if an oversize unit is chosen.
- Determine the maximum pressure loss in duct systems.
- Correct high-humidity problems.
- Decide on proper registers and grilles.

- Determine the proper locations for registers and grilles.
- Explain the necessity of using proper duct fittings.
- Lay out a floor plan for supplies and returns.
- Determine main trunk ducts correctly.
- Select proper register styles.
- Determine the total cubic feet per minute per section of extended plenum.
- Explain the letters and numbers identifying fittings.
- Determine fan speed.

### **Lesson 7 - Duct Sizing and Layout**

Objectives:

- Use and understand duct system terminology.
- Identify duct system components properly.
- Explain how static pressure affects air movements.
- Calculate total static pressure.
- List the factors that affect air flow.
- Select the proper type of duct system for an application.
- Lay out the duct system.
- Determine the proper fittings for the system.
- Use various sizing tables.

### **Lesson 8 - Air Filtration**

Objectives:

- Identify proper filtering methods of airborne contaminants.
- Explain proper filter selection.
- Describe how an electronic air cleaner operates.
- Determine the type of air filtration service required.
- Identify a self-cleaning precipitator.
- Describe how filters are cleaned and maintained.
- Describe how filters are tested.
- Explain the steps that you can take to improve indoor air quality.

### **Lesson 9 - Humidification (Part 1)**

Objectives:

- Use the proper terminology in discussing humidification.
- Identify the proper humidity levels for comfort and health.
- Measure humidity levels correctly with instruments.
- Size and select a humidifier.

### **Lesson 10 - Humidification (Part 2)**

Objectives:

- Add moisture to air by various methods.
- Install a humidifier properly.
- Control the humidity level properly.

### **Lesson 11 - Control Systems: A Functional Approach**

Objectives:

- Explain control design and operation.

- Describe control performance characteristics.
- Determine how and where to set a heat anticipator.
- Check the current draw of a heat anticipator.
- Install controls properly.

### **Lesson 12 - Review of Safety and Codes**

Objectives:

- Adhere to personal safety practices and proper equipment safety practices.
- Comply with federal, state, and local safety codes and regulations.

### **Lesson 13 - Customer Relations**

Objectives:

- Apply good business practice and customer service skills.
- Develop personal traits and attitudes that lead to improved customer relations.
- Demonstrate successful techniques of selling equipment and service.

### **Lesson 14 - Glossary of Terms**