Lesson 1 - Moisture in Air
Objectives:
- Describe the chemical makeup of dry air, and explain what is meant by "wet" air.
- State Dalton’s Law and Boyle’s Law.
- Define the terms density and specific volume.
- Explain the difference between relative humidity and absolute humidity.
- Define the terms dew point and specific humidity.
- Explain the difference between sensible heat and latent heat.
- Explain the meaning of "dry-bulb" and "wet-bulb" temperatures.
- Use the appropriate tables to make calculations and solve practical problems relating to the condition and behavior of air.

Lesson 2 - Calculating Cooling Loads
Objectives:
- Define many of the key technical terms used in air conditioning.
- Explain the various factors that determine air conditioning cooling loads.
- Obtain information from a variety of tables and other reference sources, and use such data to estimate air conditioning requirements.

Lesson 3 - Room Air Conditioners
Objectives:
- Size a room air conditioner property.
- Estimate cooling loads.
- Select a suitable room air conditioner based on the estimated cooling load.
- Make a thorough pre-installation survey to ensure the compatibility of the selected unit with the customer's electrical system.
- Choose the proper location for the installation of a room air conditioner.
- Diagnose a malfunctioning room air conditioner correctly.
- Test the refrigerant charge of a room air conditioner.

Lesson 4 - Types of Air Conditioning Systems
Objectives:
- Identify the major types of air conditioning systems.
- Explain how single-zone systems differ from multizone systems.
- Describe the basic operation of variable air volume (VAV) systems.
- Explain how induction systems work.
- Describe the various configurations of air-water systems.
- List five kinds of multiple-unit systems.

Lesson 5 - Residential Air Conditioning (Part 1)
Objectives:
- Describe the different types of cooling systems that can be added to existing heating systems.
- Describe the different types of air distribution systems that can be used in residential air conditioning installations.
- Identify various duct systems components and explain their proper use.
Lesson 6 - Residential Air Conditioning (Part 2)
Objectives:
- Identify the five basic types of residential air conditioning equipment.
- Describe the important considerations involved in draining evaporator coils.
- Explain how to adjust blower speeds.
- Describe the basic components of a residential condensing unit, and follow its sequence of operation by reading a schematic wiring diagram.
- Describe the basic components of a packaged air conditioning unit, and follow its sequence of operation by reading a schematic wiring diagram.

Lesson 7 - Residential Air Conditioning (Part 3)
Objectives:
- Evaluate residential forced-air heating systems for compatibility with add-on cooling.
- Make the necessary calculations to determine whether the blower capacity is sufficient to handle both heating and cooling.
- Check temperature rise and duct static, and use the proper graph to determine the flow rate of air through a duct system.
- Describe the factors that must be considered when planning the addition of an air conditioning evaporator coil to a forced-air furnace.
- Locate outdoor condensing units properly.

Lesson 8 - Basic Heat Pump Theory (Part 1)
Objectives:
- Describe the basic operation of a heat pump.
- Explain the function of various heat pump controls.
- Interpret the wiring diagrams and performance data provided by heat pump manufacturers.
- Determine and evaluate the coefficient of performance (COP) of a heat pump.

Lesson 9 - Basic Heat Pump Theory (Part 2)
Objectives:
- Explain the operation of a four-way reversing valve.
- Describe the proper installation and replacement of reversing valves.
- Describe the various types of applications in which reversing valves are used.
- Diagnose and troubleshoot reversing valve malfunctions.

Lesson 10 - Water-Source Heat Pumps
Objectives:
- Describe how outdoor conditions affect the perimeter load of a building.
- Explain the basic principles of operation of water-to-air heat pumps.
- Determine the best location and method of installation for individual heat recover units.
- Explain how large vertical units are installed and piped.
- Diagnose water-source heat pump malfunctions and suggest corrective procedures.
Lesson 11 - Psychrometrics
Objectives:
- Define the following terms as they apply to the study of psychrometrics: sensible heat, latent heat, barometric pressure, density, dew point, relative humidity, specific humidity, specific volume, and enthalpy.
- Explain how to use psychrometric tables and chairs to find various properties of air.

Lesson 12 - The Psychrometric Calculator
Objectives:
- Use a psychrometric calculator to find various properties of air, including dry-bulb temperature, wet-bulb temperature, dew point, specific volume, sensible heat, latent heat, vapor pressure, and density.
- Use a circular slide rule.

Lesson 13 - Computer Room Environmental Control
Objectives:
- Describe the effects of humidity in computer rooms.
- Explain the reasons for using raised floors in computer rooms.
- Discuss the advantages of using packaged units specifically designed for computer room applications.
- Describe the operation of temperature and humidity recorders.
- List and identify the tools necessary for providing efficient service.
- Explain the different types of head pressure controls.

Lesson 14 - Economizer Systems (Part 1)
Objectives:
- Explain the purpose of an economizer system.
- Describe the economizer’s damper positions during each of its cycles of operation.
- Explain the basic operating sequence of a packaged economizer.

Lesson 15 - Economizer Systems (Part 2)
Objectives:
- Describe the operating cycle of a typical rooftop economizer.
- Explain the difference between integrated and non-integrated economizers.
- Discuss the basic principles of operation of various economizer controls and components, including dampers, motors, outdoor-air thermostats, enthalpy controls, mixed-air thermostats, and minimum position potentiometers.
- Describe the proper installation of a rooftop economizer.
- Identify the symptoms of various economizer problems, and describe possible causes and corrective actions.