Lesson 1 - Combustion Chemistry
Objectives:
- Describe the basic chemistry of combustion.
- Define heat of combustion.
- Define draft, and explain methods for creating draft.
- Explain how venting is accomplished.

Lesson 2 - Heating Fuels: Gas
Objectives:
- Identify the chemical properties of methane, manufactured gas, and liquid petroleum gas.
- Explain the proper tank sizing and pipe-sizing practices for LP gas.
- Describe the operation of an LP-gas pressure regulator.

Lesson 3 - Burners and Accessories
Objectives:
- Explain the function of a heat exchanger.
- List the basic components of a gas-fired heating system.
- Describe the types of gas pilots and their operation.
- Explain the procedure for venting.

Lesson 4 - Burner Types and Components
Objectives:
- Trace the origins of gas fuels.
- Describe the features of a gas burner.
- Describe the features of a pilot burner.
- Explain how major gas flow controls function.
- Define "orifice" and "orifice spud."

Lesson 5 - Gas Burners: Equipment Location and Piping for Natural and Manufactured Gas
Objectives:
- List the major considerations for good flue design.
- Describe major guidelines for good natural gas piping design.
- Demonstrate how to determine gas input rates for furnaces and boilers.

Lesson 6 - Gas Burners: LP Gas Installation Procedures
Objectives:
- Name two agencies that set standards for LP-gas storage tanks.
- Describe the proper placement of the storage tank in an LP-gas installation.
- State the requirements for a proper LP-gas piping installation.

Lesson 7 - Start-Up and Combustion Efficiency Testing
Objectives:
- List the tools needed for testing combustion of a gas heating system.
- Differentiate between a water-filled and mercury-filled U-gauge and their applications.
- Explain the Importance of air in the combustion process.
- Describe how various types of flames reflect the gas combustion process.

Lesson 8 - Gas Burner Controls: Types, Purpose, and Function
Objectives:
- Explain the three-classifications of inter-related control circuits.
- Identify the types of pilot burner orifices.
- Differentiate between primary aerated and nonprimary aerated pilots.
- Describe the functions of thermocouple systems.
- Describe troubleshooting procedures for gas system controls.

Lesson 9 - Combination Gas Controls
Objectives:
- Name the five basic components of a combination gas control.
- Describe the normal operation of a servo-type pressure regulator.
- Explain how the maximum capacity of the combination gas control is determined.

Lesson 10 - Ignition Systems for Infrared Heaters
Objectives:
- Describe the three main types of infrared heaters.
- Explain the four types of normal lighting sequences presented in this Lesson.
- List the safety sequences for ignition and glow-coil systems.
- Describe the normal lighting sequence for automatic, intermittent, proven pilot spark ignition systems.

Lesson 11 - Gas Heating Equipment Maintenance
Objectives:
- Perform a temperature rise check of the heating system.
- Check the combustion vestibule (burner, control area).
- Adjust and check for proper functioning of the pilot.
- Explain how to perform open and closed circuit checks.
- Describe a checking procedure for the gas manifold pressure.
- Explain the control-circuit current draw checking procedure.

Lesson 12 - Troubleshooting
Objectives:
- Describe how the use of guidelines and checklists help in troubleshooting a gas heating system.
- Determine the primary source of a gas heating problem as noise, odor, or operating costs.
- Clarify the differences among combustion noise, mechanical noise, and air noise.
- Explain how an odor problem develops from fuel and combustion and the air system.
- Describe how operating costs relate to a problem that requires troubleshoot a system.

Lesson 13 - Condensing Furnaces
Objectives:
- Explain the purpose of a AFUE number.
- Describe a 90%-high efficiency gas furnace.
- List the major component difference between a high efficiency gas furnace and a standard 80% furnace.

Lesson 14 - Appendix