6 Week Day Program/9 Week Evening Program 180 HRS.

Program Objective

This program is designed to teach students the basic technical skills, abilities and work habits required to pursue an entry-level position as a Heating, Air Conditioning and Refrigeration mechanic and installer. Graduates of this program will be able to apply technical knowledge and skills to repair, install, service and maintain the operating condition of heating, air conditioning and refrigeration systems, determine space air-flow requirements, cut and drill metal with saws and drills, measure temperature in air-conditioning systems, measure refrigerant temperature, measure relative humidity, measure voltage in electrical circuit, clean coils, fans and registers, Graduates of this program may find entry-level employment as heating, air conditioning and refrigeration mechanics and installers.

*Students will receive a Certificate of Completion at the satisfactory completion of these courses.

Course Descriptions

HVAC 101 - HVAC Fundamentals

This course is designed to explore the common aspects of HVAC technology. Students will learn industry terminology, definitions and standards that can be applied in a workplace environment.

[Prerequisites: None]

HVAC 102 - Safety

Presentations and course work cover safety training. Students will learn to identify and practice key safety factors in the HVAC workplace/worksite including: 1) Describing and demonstrating proper general and personal worksite safety that includes proper use of Personal Protective Equipment (PPE), basic safety principles to ensure for maximum back and fall protection, and personal safety working in confined spaces,

and maneuvering on ladders, scaffolds and lifts. 2) Learn about the importance of information on Hazard Communication Labels, and Material Safety Data Sheets. 3) Describe electrical lockout/tagout, proper use and operation of fire extinguishers and compressed gas safety.
[Prerequisites: HVAC 101 Fundamentals]

HVAC 103 - Electrical

This course provides an introduction to basic electrical theory and covers basic and parallel circuits, circuit characteristics, schematics, symbols and measurements. The course also introduces the student to common single-phase and small three-phase electric motors. Presentations will include starting components and protection devices and motor troubleshooting. The course will cover open and hermetic motors, capacitor motors and diagnosing and replacing electric motors.
[Prerequisites: HVAC 102]

HVAC 104 - Systems Properties & Measurement

This subject provides an introduction to HVAC comfort systems. Students will learn about the principles of human comfort, air properties, introduction to psychrometrics, and airflow measurement methods and calculations. Course presentations and work will also cover heat energy and comfort, psychrometrics, total heat in air, measuring a heavy invisible moving volume, and air flow measurement.
[Prerequisites: HVAC 103]

HVAC 105 - Refrigeration

This course will serve as an introduction to the mechanical compression refrigeration cycle and the components necessary for operation. Students will be introduced to common components and the terms and definitions of the cycle. Topics covered include basic refrigeration cycle physics, compression and compressors, condensation and condensers, expansion and metering devices, evaporation and evaporators, and measuring the normal cycle.
[Prerequisites: HVAC 104]

HVAC 106 - Gas Heat

This course covers combustion basics for natural gas and propane fuels as found in residential and light commercial applications. Students will identify and learn about the common types of gas heating equipment and fuel gas composition, pressure regulators, burners, heat exchangers, standing pilot systems, electronic ignition, high efficiency furnaces, and troubleshooting gas burner systems.

[Prerequisites: HVAC 105]

HVAC 107 - Installation

Students will learn about the installation and servicing process of components for different types of air conditioning and refrigeration systems. The course covers blueprints and diagrams, fuel and water supply lines, air ducts and vents, pumps, electrical wiring and controls, conducting service checks and trouble shooting. Students will engage in lab working on different systems applying the skills and knowledge acquired.

[Prerequisites: HVAC 106]

HVAC 108 - HVAC Control 1

This course covers the control of pressure and temperature; energy sources for control systems; operation principles of automatic control systems; the types of control action and control circuits; starters, contractors and relays; and fundamental controls for valves and dampers.

[Prerequisites: HVAC 107]

HVAC 109 - Job Search Techniques

Students will learn to demonstrate job search and retention techniques and identify job search strategies to prepare for employment.

[Prerequisites: HVAC 108]

20 Week Day Program/30 Week Evening Program 600 HRS.

Program Objective

This program is designed to teach students the basic technical skills, abilities and work habits required to pursue an entry-level position as a Heating, Air Conditioning and Refrigeration mechanic and installer. Graduates of this program will be able to apply technical knowledge and skills to repair, install, service, and maintain the operating condition of heating, air conditioning and refrigeration systems, determine space air-flow requirements, cut and drill metal with saws and drills, measure temperature in air-conditioning systems, measure refrigerant temperature, measure relative humidity, measure voltage in electrical circuit, clean coils, fans and registers. Graduates of this program may find entry-level employment as heating, air conditioning and refrigeration mechanics and installers.

*Students will receive a Certificate of Completion at the satisfactory completion of these courses.

Course Descriptions

HVAC 101 - HVAC Fundamentals

This course is designed to explore the common aspects of HVAC technology. Students will learn industry terminology, definitions and standards that can be applied in a workplace environment.

[Prerequisites: None]

HVAC 102 - Safety

Presentations and course work cover Safety Training. Students will learn to identify and practice key safety factors in the HVAC workplace/worksite including: 1) Describing and demonstrating proper general and personal worksite safety that includes proper use of Personal Protective Equipment (PPE), basic safety principles to ensure for maximum back and fall protection, and personal safety working in confined spaces, and maneuvering on ladders, scaffolds and lifts. 2) Learn about the importance of information on Hazard Communication Labels, and Material Safety Data Sheets. 3) Describe electrical lockout/tagout, proper use and operation of fire extinguishers and compressed gas safety.

[Prerequisites: HVAC 101 Fundamentals]

HVAC 103 - Electrical

This course provides an introduction to basic electrical theory and covers basic and parallel circuits, circuit characteristics, schematics, symbols and measurements. The course also introduces the student to common single-phase and small three-phase electric motors. Presentations will include starting components and protection devices and motor troubleshooting. The course will cover open and hermetic motors, capacitor motors and diagnosing and replacing electric motors.

[Prerequisites: HVAC 102]

HVAC 104 - Systems Properties & Measurement

This subject provides an introduction to HVAC comfort systems. Students will learn about the principles of human comfort, air properties, introduction to psychrometrics, and airflow measurement methods and calculations. Course presentations and work will also cover heat energy and comfort, psychrometrics, total heat in air, measuring a heavy invisible moving volume, and air flow measurement.

[Prerequisites: HVAC 103]

HVAC 105 - Refrigeration

This course will serve as an introduction to the mechanical compression refrigeration cycle and the components necessary for operation. Students will be introduced to common components and the terms and definitions of the cycle. Topics covered include basic refrigeration cycle physics, compression and compressors, condensation and condensers, expansion and metering devices, evaporation and evaporators, and measuring the normal cycle.

[Prerequisites: HVAC 104]

HVAC 106 - Gas Heat

This course covers combustion basics for natural gas and propane fuels as found in residential and light commercial applications. Students will identify and learn about the common types of gas heating equipment and fuel gas composition, pressure

regulators, burners, heat exchangers, standing pilot systems, electronic ignition, high efficiency furnaces, and troubleshooting gas burner systems.
[Prerequisites: HVAC 105]

HVAC 107 - Installation

Students will learn about the installation and servicing process of components for different types of air conditioning and refrigeration systems. The course covers blueprints and diagrams, fuel and water supply lines, air ducts and vents, pumps, electrical wiring and controls, conducting service checks and trouble shooting. Students will engage in lab working on different systems applying the skills and knowledge acquired.
[Prerequisites: HVAC 106]

HVAC 108 - HVAC Control 1

This course covers the control of pressure and temperature; energy sources for control systems; operation principles of automatic control systems; the types of control action and control circuits; starters, contractors and relays; and fundamental controls for valves and dampers.
[Prerequisites: HVAC 107]

HVAC 109 - Job Search Techniques

Students will learn to demonstrate job search and retention techniques and identify job search strategies to prepare for employment.
[Prerequisites: HVAC 108]

(30 Week Day Program/45 Week Evening Program) 900 HRS.

Program Objective

This program is designed to teach students the technical skills, abilities and work habits required to pursue a position as a Heating, Air Conditioning and Refrigeration Mechanic and Installer. Graduates of this program will be able to apply technical

knowledge and skills to repair, install, service, and maintain the operating condition of heating, air conditioning and refrigeration systems as well as chillers to determine space air-flow requirements, cut and drill metal with saws and drills, weld various metals such as steel and copper, measure temperature in air-conditioning systems, measure refrigerant temperature, measure relative humidity, measure voltage in electrical circuit, clean coils, fans and registers. Graduates of this program may find employment as a commercial or industrial Heating, Air Conditioning and Refrigeration Mechanic and Installer**.**

*Students will receive a Certificate of Completion at the satisfactory completion of these courses.

Course Descriptions

HVAC 301 – Fundamentals

This course is designed to explore the common aspects of HVAC technology. Students will learn industry terminology, definitions, and standards that can be applied in a workplace environment. Students will learn wet and dry systems. Introduction to basic & advanced components and diagnostics in a commercial and industrial environment. Understand refrigeration principles by applying the operation and function of a system in a lab setting.

[Prerequisites: None]

HVAC 302 - Safety

Presentations and course work cover safety training. Students will learn to identify and practice key safety factors in a residential, commercial, and industrial HVAC workplace/worksite including: 1) describing and demonstrating proper general and personal worksite safety that includes proper use of Personal Protective Equipment (PPE), basic safety principles to ensure for maximum back and fall protection, and personal safety working in confined spaces, and maneuvering on ladders, scaffolds and lifts 2) learn about the importance of information on Hazard Communication Labels, and Material Safety Data Sheets, 3) describe electrical lockout/tagout, proper use and operation of fire extinguishers and compressed gas safety, 4) Students will learn

compliance with OSHA and EPA regulations and general OSHA requirements on the jobsite.
[Prerequisites: HVAC 301 Fundamentals]

HVAC 303 – Electrical/ Motors

This course provides an introduction to electrical theory and covers basic and parallel circuits, circuit characteristics, schematics, symbols, and measurements. The course also introduces the student to common single-phase as well as industrial three-phase electric motors. Presentations will include starting components, and protection devices, and motor troubleshooting. The course will cover various motors such as: 1) open & hermetic, 2) residential 1 horse power and less, 3) commercial 1-3 horse power, 4) industrial up to 25 horse power.
[Prerequisites: HVAC 302]

HVAC 304 – Advanced HVAC System Controls

This course covers the control of pressure and temperature, energy sources for control systems, operation principles of automatic control systems, the types of control action and control circuits. The course also covers starters, contractors and relays, troubleshooting techniques, information included regarding system safety, PC Programmers, low and high voltage control panels.
[Prerequisites: HVAC 303]

HVAC 305 – Refrigerant Conversion

Due to the Environmental Protection Agency, phase out of most refrigerants are scheduled for 2020. This course includes drop-in replacements, filled applications of alternate refrigerants, and provides an introduction to HVAC comfort systems. Students will learn about the principles of human comfort, air properties, introduction to psychrometrics, and airflow measurement methods and calculations. Course presentations and work will also cover heat energy and comfort, psychrometrics, total heat in air, measuring a heavy invisible moving volume, and air flow measurement.
[Prerequisites: HVAC 304]

HVAC 306 – Refrigeration

This course will serve as an introduction to the mechanical compression refrigeration cycle and the components necessary for operation. Students will be introduced to common components and the terms and definitions of the cycle. Topics covered include basic and advanced refrigeration cycle physics, compression and compressors, condensation and condensers, expansion and metering devices, evaporation and evaporators, and measuring the normal cycle.

[Prerequisites: HVAC 305]

HVAC 307 – Welding and Brazing Techniques

This course covers training in welding with gas, arc, and mig basics. Students will learn to identify the different types of welds and welding safety procedures. Students will also learn the different types of welding techniques from piping systems to running water lines and the proper procedures for brazing and cutting with welding equipment.

[Prerequisites: HVAC 306]

HVAC 308 - Gas Heat & Heat Pumps

This course covers combustion basics for natural gas and propane fuels as found in residential, commercial, and industrial applications. Students will identify and learn about the common types of gas heating equipment and common types of pressure regulators, burners, heat exchangers, standing pilot systems, electronic ignition, high efficiency furnaces, and troubleshooting gas burner systems in an industrial setting. Students will learn heat pump properties, principles, and heat pump installation.

[Prerequisites: HVAC 307]

HVAC 309 – Installation, Variable Refrigerant Flow, and Chillers

Students will learn about Variable Refrigerant Flow (VRF), properties, installation, government regulations, and industry standard national codes. Students will learn about the installation and servicing process of components for different types of air conditioning and refrigeration systems in residential, commercial, and industrial settings. The course covers blueprints and diagrams, fuel and water supply lines, air

ducts and vents, pumps, electrical wiring and controls, conducting service checks and troubleshooting, pneumatics, bearings, pumps, piping systems, and chillers. Students will engage in lab working on different systems applying the skills and knowledge acquired.
[Prerequisites: HVAC 308]

HVAC 310 - Job Search Techniques

Students will learn to demonstrate job search and retention techniques and identify job search strategies to prepare for employment.
[Prerequisites: HVAC 309]