CENTER for APPRENTICESHIP & ADULT TRAINING
520 Butler Farm Rd, Hampton VA 23666
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Course Name: HVAC Level II

Contact Hours: 144

Number of Sessions: 48

Number of Hrs. /Session: 3

Mode of Instruction: Classroom

Course Description:
Course is designed based on the NCCER curriculum. Upon successful completion of the course,Student's must take all four levels of HVAC in order to receive a diploma/certificate from New Horizons.New Horizons does not provide credentialing with NCCER.

Text: HVAC Level 2, ISBN: 978- 0135185124

Course Outline and Modules:

1. Alternating Current (10 hours) Presents the basic concepts of alternating current generation and use. It also discusses how single- and three-phase alternating current is used to power resistive and inductive circuits in HVAC/R equipment. Various types of transformers used in HVAC systems are identified. The basic operation of single- and three-phase motors is explained. In addition, the process of safely testing AC-powered devices is covered. (Module ID 03206)
2. Compressors (12.5 hours) Presents refrigerant compressors. Since the compressor is considered the heart of any HVAC system, its good health and well-being are crucial to overall system performance and reliability. Compressors can take many forms, but they all perform the same basic function. They create the pressure differential in the system that allows refrigerant to move through the metering device and through the condenser and evaporator coils where heat is exchanged. Because the compressor is the most expensive component in most HVAC systems, it is important that technicians be able to correctly diagnose and correct problems that can affect compressor operation to avoid a costly compressor replacement. (Module ID 03302)
3. Refrigerants and Oils (15 hours) Discusses the refrigerants and oils used in modern refrigeration and air conditioning systems. Today, new technologies and stringent environmental laws are driving changes in the HVAC industry. Older refrigerants that damage the environment are being phased out and replaced with more environmentally-friendly refrigerants. These new refrigerants often require new compressor lubricating oils. These modern refrigerants and oils also have new handling and service requirements with which technicians must be familiar. (Module ID 03301)
4. Leak Detection, Evacuation, Recovery, and Charging (30 hours) Provides trainees with guidance related to servicing the refrigerant circuit of HVAC systems. The four essential service tasks—leak detection, evacuation, recovery, and charging—are covered in detail. In addition, information related to

the US EPA's requirements for providing these services in an environmentally sound manner are also provided. Developing the necessary skills to provide these services are vital to the future success of trainees in the HVAC/R trade. To that end, a significant amount of this module is devoted to hands-on practice and the successful completion of its required performance tasks. (Module ID 03205)

5. Metering Devices (12.5 hours) Introduces metering devices used in the mechanical refrigeration cycle. The primary function of metering devices is presented, along with related components such as the distributor. The operation of capillary tube, fixed-orifice, and expansion-type metering devices is explored in detail. In addition, the process of selecting and installing thermal expansion valves specifically is covered. (Module ID 03303)
6. Heat Pumps (20 hours) Introduces heat pumps, a very efficient form of electric heat. Compared to straight electric heat, heat pumps can consistently operate at higher energy efficiency. This module presents the operation of heat pump systems in detail with additional emphasis on the most common form of supplemental heat, electric resistance heating elements. The installation considerations of both split and packaged heat pumps systems are also reviewed. (Module ID 03211)
7. Basic Maintenance (20 hours) An introduction to common tasks associated with the basic maintenance of HVACR systems. Specific tasks, such as lubrication and belt installation, are discussed in detail. In addition, the module describes the general procedures for performing inspections and periodic maintenance of gas furnaces and common cooling/heat pump systems, including how to complete the required documentation. (Module ID 03215)
8. Chimneys, Vents, and Flues (5 hours) Covers the chimneys, vents, and flues that are used with fuel-burning furnaces and boilers. All fuel-burning appliances must have adequate air for complete combustion and must have a means to safely remove the products of combustion. Different types of fuel-fired furnaces and boilers have different and unique requirements for venting the products of combustion. (Module ID 03202)
9. Sheet Metal Duct Systems (10 hours) Covers sheet metal duct systems. While other materials can be used to fabricate air ducts, sheet metal has been and continues to be one of the most popular materials for this purpose. Major advantages of sheet metal ducts systems include low resistance to airflow, strength, and durability. In addition to using time-tested assembly methods, modern sheet metal duct systems need to be sealed to prevent leakage of conditioned air, and insulated to prevent heat loss or heat gain through the walls of the duct. (Module ID 03213)
10. Fiberglass and Fabric Duct Systems (7.5 hours) Reviews the application and methods of fabricating fiberglass duct systems. In addition, the installation guidelines for installing a fiberglass system are presented, along with the methods to repair damaged components. The module concludes with

coverage of fabric-based duct systems, which have become increasingly popular in a variety of applications. (Module ID 03214)

11. Commercial Airside Systems (12.5 hours) Introduces the air distribution systems used in commercial structures such as schools and office buildings that are divided into comfort heating and cooling zones. The module covers the various types of systems, as well as the air terminals and air source equipment used in these systems. Accessories commonly used with commercial systems are also covered. (Module ID 03201)
12. Air Quality Equipment (5 hours) Introduces the factors related to indoor air quality and human comfort. Since humidity is a common comfort factor for all types of buildings, the equipment used to control humidity is presented in detail. The module also covers the air filtration materials and the introduction of outside air into the indoor environment. (Module ID 03204)
13. Introduction to Hydronic Systems (15 hours) Introduces hydronic heating systems. In hydronic heating systems, fluids (typically water) are used to transfer heat. Fuels such as gas or oil are used to heat the water in a boiler. Pumps then circulate that heated water throughout the structure where terminal devices such as radiators release the heat into different areas. (Module ID 03203)