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COURSE  
CATALOG  
**2021**



## COURSE CATALOG 2021

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# LEARN. APPLY. THRIVE.

## Welcome to Virginia Technical Academy!

As the President and CEO of Virginia Technical Academy (VTA), I am very excited to welcome you to our academic program. I have personally developed the courses in our program and have taught the HVAC, appliance and electrical classes to ensure that you will gain a meaningful learning experience.

Whether you are enrolled in our day courses, night courses or apprenticeship programs, you will be challenged to learn and practice skills to either enhance or start your career in a trade profession. You will not just be given facts to memorize as much as you will be given information to process and think on your own. This is a challenging program, but the staff and instructors are here to help guide you through your studies.

All our courses and apprenticeship programs are approved by the State Council of Higher Education for Virginia, the Department of Professional and Occupational Regulation (DPOR), and the Virginia Department of Labor and Industry. When you have successfully completed your course work, you will be prepared to obtain a job in the trade profession.

Congratulations on your decision to enroll with Virginia Technical Academy! You have taken the first step to a promising future. Again, welcome!

*President & CEO*  
**David Gillespie**





HVAC, ELECTRICAL  
AND PLUMBING  
PREREQUISITE

#### DURATION



**80 HOURS**  
14 days of class  
35 hours a week

THEORY  
**66%**

PERFORMANCE  
**34%**

# CORE CURRICULUM CC-100 Course

## COURSE OUTLINE

HOURS	MODULE	OBJECTIVE OUTLINE OF TRAINING
 <b>12.5</b>	No. 1	<b>Basic Safety (Construction Site Safety Orientation)</b> Presents basic jobsite safety information to prepare workers for the construction environment. Describes the common causes of workplace incidents and accidents and how to avoid them. Introduces common personal protective equipment, including equipment required for work at height, and its proper use. Information related to safety in several specific environments, including welding areas and confined spaces, is also provided.
 <b>10</b>	No. 2	<b>Introduction to Construction Math</b> Reviews basic math skills related to the construction trades and demonstrates how they apply to the trades. Covers multiple systems of measurement, decimals, fractions, and basic geometry.
 <b>10</b>	No. 3	<b>Introduction to Hand Tools</b> Introduces common hand tools used in a variety of construction crafts. Identifies tools and how to safely use them. Also presents proper hand tool maintenance.
 <b>10</b>	No. 4	<b>Introduction to Power Tools</b> Identifies and describes the operation of many power tools common in the construction environment. Provides instruction on proper use, as well as safe-handling guidelines and basic maintenance.
 <b>10</b>	No. 5	<b>Introduction to Construction Drawings</b> Introduces the basic terms, components, and symbols of construction drawings, as well as the most common drawing types. Also covers the interpretation and use of drawing dimensions.
 <b>7.5</b>	No. 6	<b>Introduction to Basic Rigging</b> Provides basic information related to rigging and rigging hardware, such as slings, rigging hitches, and hoists. Emphasizes safe working habits in the vicinity of rigging operations.
 <b>7.5</b>	No. 7	<b>Basic Communication Skills</b> Provides techniques for effective communication on the job. Includes examples that emphasize the importance of both written and verbal communication skills. Describes the importance of reading skills in the construction industry and discusses effective telephone and email communication skills.
 <b>7.5</b>	No. 8	<b>Basic Employability Skills</b> Describes the opportunities offered by the construction trades. Discusses critical thinking and essential problem-solving skills. Also identifies and discusses positive social skills and presents information on computer systems and their industry applications.
 <b>5</b>	No. 9	<b>Introduction to Material Handling</b> Describes the hazards associated with handling materials and provides techniques to avoid both injury and property damage. Also introduces common material handling equipment.











**The CORE CURRICULUM COURSE is a prerequisite for HVAC, ELECTRICAL, PLUMBING & FACILITIES MAINTENANCE Programs.**

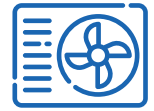
Once completed, students can proceed with LEVELS 1, 2, 3 & 4.

# HVAC

## HV-101 Course

### COURSE OUTLINE

HOURS	MODULE	OBJECTIVE OUTLINE OF TRAINING
 7.5	No. 1	<b>Introduction to HVAC</b> Covers the basic principles of heating, ventilating, and air conditioning, career opportunities in HVAC, and how apprenticeship programs are constructed. Basic safety principles, as well as trade licensure and EPA guidelines, are also introduced.
 10	No. 2	<b>Trade Mathematics</b> Explains how to solve HVAC/R trade-related problems involving the measurement of lines, area, volume, weights, angles, pressure, vacuum, and temperature. Also includes a review of scientific notation, powers, roots, and basic algebra and geometry.
 12.5	No. 3	<b>Basic Electricity</b> Introduces the concept of power generation and distribution, common electrical components, AC and DC circuits, and electrical safety as it relates to the HVAC field. Introduces reading and interpreting wiring diagrams.
 15	No. 4	<b>Introduction to Heating</b> Covers the fundamentals of heating systems and the combustion process. Provides the different types and designs of gas furnaces and their components, as well as basic procedures for their installation and service.
 30	No. 5	<b>Introduction to Cooling</b> Explains the fundamental operating concepts of the refrigeration cycle and identifies both primary and secondary components found in typical HVAC/R systems. Also introduces common refrigerants. Describes the principles of heat transfer and the essential pressure-temperature relationships of refrigerants. Introduces basic control concepts for simple systems.
 15	No. 6	<b>Introduction to Air Distribution Systems</b> Describes the factors related to air movement and its measurement in common air distribution systems. Presents the required mechanical equipment and materials used to create air distribution systems. Introduces basic system design principles for both hot and cold climates.
 10	No. 7	<b>Basic Copper and Plastic Piping Practices</b> Explains how to identify types of copper tubing and fittings used in the HVAC/R industry and how they are mechanically joined. Also presents the identification and application of various types of plastic piping, along with their common assembly and installation practices.
 10	No. 8	<b>Soldering and Brazing</b> Introduces the equipment, techniques, and materials used to safely join copper tubing through both soldering and brazing. Covers the required personal protective equipment, preparation, and work processes in detail. Also provides the procedures for brazing copper to dissimilar materials.
 10	No. 9	<b>Basic Carbon Steel Piping Practices</b> Explains how to identify various carbon steel piping materials and fittings. Covers the joining and installation of threaded and grooved carbon steel piping systems, including detailed descriptions of threading and grooving techniques.



### HVAC

### DURATION



**120 HOURS**  
**4 WEEKS**

THEORY  
**57%**

PERFORMANCE  
**43%**



## HVAC

### DURATION



**175 HOURS  
5 WEEKS**



**THEORY  
61%**



**PERFORMANCE  
39%**

# HVAC

## HV-102 Course








### COURSE OUTLINE

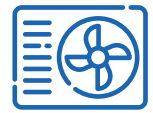
HOURS	MODULE	OBJECTIVE OUTLINE OF TRAINING
 <b>10</b>	No. 1	<b>Alternating Current</b> Transformers, single-phase and three-phase power distribution, capacitors, the theory and operation of induction motors, and the instruments and techniques used in testing AC circuits and components. Also reviews electrical safety.
 <b>12.5</b>	No. 2	<b>Compressors</b> Explains operating principles of compressors used in comfort air-conditioning and refrigeration systems. Includes installation, service, and repair procedures.
 <b>15</b>	No. 3	<b>Refrigerants and Oils</b> Characteristics and applications of pure and blended refrigerants, and provides extensive coverage of lubricating oils used in refrigeration systems.
 <b>30</b>	No. 4	<b>Leak Detection, Evacuation, Recovery, and Charging</b> Refrigerant handling and equipment servicing procedures for HVAC systems in an environmentally safe manner.
 <b>12.5</b>	No. 5	<b>Metering Devices</b> Operating principles, applications, installation, and adjustment of fixed and adjustable expansion devices used in air-conditioning equipment.
 <b>20</b>	No. 6	<b>Heat Pumps</b> Principles of reverse cycle heating. Describes the operation of heat pumps and explains how to analyze heat pump control circuits. Includes heat pump installation and service procedures.
 <b>20</b>	No. 7	<b>Basic Maintenance</b> Covers information related to maintenance-oriented materials, as well as guidelines for the inspection and periodic maintenance of various systems and accessories. Also covers the application of gaskets and seals, as well as the adjustment of different types of belt drives. Includes information on inspection and maintenance requirements for selected equipment.
 <b>5</b>	No. 8	<b>Chimneys, Vents, and Flues</b> Principles of venting fossil fuel furnaces and methods for selecting and installing vent systems for gas-fired heating equipment.
 <b>10</b>	No. 9	<b>Sheet Metal Duct Systems</b> Layout, fabrication, installation, and insulation of sheet metal ductwork. Also includes selection and installation of registers, diffusers, dampers, and other duct accessories.
 <b>7.5</b>	No. 10	<b>Fiberglass and Flexible Duct Systems</b> Layout, fabrication, installation, and joining of fiberglass ductwork and fittings. Describes the proper methods for attaching and supporting flex duct.
 <b>12.5</b>	No. 11	<b>Commercial Airside Systems</b> Describes the systems, equipment, and operating sequences commercial airside system configurations such as constant volume single-zone and multi-zone, VVT, VAV, and dual-duct VAV.
 <b>5</b>	No. 12	<b>Air Quality Equipment</b> Principles, processes, and devices used to control humidity and air cleanliness, as well as devices used to conserve energy in HVAC systems.
 <b>15</b>	No. 13	<b>Introduction to Hydronic Systems</b> Introduces hot water heating systems, focusing on safe operation of the low-pressure boilers and piping systems in residential applications.

# HVAC

## HV-103 Course

### COURSE OUTLINE

HOURS	MODULE	OBJECTIVE OUTLINE OF TRAINING
 10	No. 1	<b>Fasteners, Hardware, and Wiring Terminations</b> Covers a variety of fasteners, hardware, and wiring terminations used in HVAC systems including the installation of these components.
 30	No. 2	<b>Control Circuit and Motor Troubleshooting</b> Provides information and skills to troubleshoot control circuits and electric motors found in heating and cooling equipment.
 20	No. 3	<b>Troubleshooting Cooling</b> Provides guidance related to troubleshooting cooling systems.
 12.5	No. 4	<b>Troubleshooting Heat Pumps</b> Explains the function and operation of basic electronic devices, including semiconductors, diodes, rectifiers, and transistors.
 15	No. 5	<b>Troubleshooting Gas Heating</b> Information and skills needed to troubleshoot gas-fired furnaces and boilers.
 15	No. 6	<b>Troubleshooting Oil Heating</b> Describes the construction and operation of oil-fired heating systems and their components. Includes servicing and testing of oil furnaces and procedures for isolating and correcting oil furnace malfunctions.
 7.5	No. 7	<b>Troubleshooting Accessories</b> Information and skills needed to troubleshoot various air treatment accessories used with heating and cooling equipment.
 15	No. 8	<b>Zoning, Ductless, and Variable Refrigerant Flow Systems</b> Introduces the information and skills needed to troubleshoot and repair zoned, ductless, and variable refrigerant flow systems.
 12.5	No. 9	<b>Commercial Hydronic Systems</b> Reviews basic properties of water and describes how water pressure is related to the movement of water through piping systems. Describes various types and components of commercial hot-water heating and chilled-water cooling systems, and examines how those systems function.
 10	No. 10	<b>Steam Systems</b> Focuses on the use of steam for storing and moving energy in HVAC systems. Reviews the fundamentals of water that relate to steam and describes the basic steam system cycle. Discusses a steam system's operational components steam boilers and their accessories and controls; steam system loads, including heat exchangers/converters; and terminal devices. Steam system valves/piping are covered in detail, including common types of piping arrangements; the components of a condensate return/feedwater system; steam and condensate pipe sizing; and pressure-reducing valves and thermostatic valves.
 15	No. 11	<b>Retail Refrigeration System</b> The applications, principles, and troubleshooting of retail refrigeration systems.
 5	No. 12	<b>Customer Relations</b> Presents the importance of establishing good relations with customers and provides guidance on how to achieve that goal. Focuses on ways for a technician to make a good first impression and describes how to communicate in a positive manner with customers. The elements of a service call and dealing with different types of problem customers are also covered.



### HVAC

### DURATION



**167.5 HOURS**  
**5 WEEKS**





## HVAC

### DURATION



**160 HOURS  
5 WEEKS**







THEORY **55%**

PERFORMANCE **45%**

# HVAC

## HV-104 Course

### COURSE OUTLINE

HOURS	MODULE	OBJECTIVE OUTLINE OF TRAINING
 <b>10</b>	No. 1	<b>Water Treatment</b> Explains water problems encountered in heating and cooling systems and identifies water treatment methods and equipment. Covers basic water testing procedures and chemistry.
 <b>12.5</b>	No. 2	<b>Indoor Air Quality</b> The installation of electric circuits in health care facilities, including the requirements for life safety and critical circuits.
 <b>7.5</b>	No. 3	<b>Energy Conservation Equipment</b> Covers heat recovery/reclaim devices, as well as other energy recovery equipment used to reduce energy consumption in HVAC systems.
 <b>12.5</b>	No. 4	<b>Building Management Systems</b> Explains how computers and microprocessors are used to manage zoned HVAC systems. Provides coverage of various network protocols and systems controllers, and introduces trainees to the various means of connection and system interface.
 <b>15</b>	No. 5	<b>System Air Balancing</b> Fire alarm control units, Digital Alarm Communicator Systems (DACS), wiring for alarm initiating and notification devices, and alarm system maintenance.
 <b>15</b>	No. 6	<b>System Startup and Shutdown</b> Covers various types of transformers and their applications. Also provides information on selecting, sizing, and installing these devices.
 <b>12.5</b>	No. 7	<b>Construction Drawings and Specifications</b> Teaches how to interpret drawings used in commercial construction, including mechanical drawings, specifications, shop drawings, and as-builts. Explains how to perform takeoff procedures for equipment, fittings, ductwork, and other components.
 <b>22.5</b>	No. 8	<b>Heating and Cooling System Design</b> Identifies factors that affect heating and cooling loads. Explains the process by which heating and cooling loads are calculated, and how load calculations are used in the selection of heating and cooling equipment. Covers basic types of duct systems and their selection, sizing, and installation requirements.
 <b>20</b>	No. 9	<b>Commercial/Industrial Refrigeration Systems</b> Expands on the study of product and process refrigeration equipment by describing systems used in cold storage and food processing applications, as well as transportation refrigeration. Various types of defrost systems are covered in detail.
 <b>10</b>	No. 10	<b>Alternative and Specialized Heating and Cooling Systems</b> Describes alternative devices used to reduce energy consumption, including wood, coal, and pellet-fired systems, waste-oil heaters, geothermal heat pumps, solar heating, in-floor radiant heating, and direct-fired makeup units. Also introduces application-specific computer room environmental and air turnover systems.
 <b>22.5</b>	No. 11	<b>Fundamentals of Crew Leadership</b> While this module has been designed to assist the recently promoted crew leader, it is beneficial for anyone in management. The course covers basic leadership skills and explains different leadership styles, communication, delegating, and problem solving. Jobsite safety and the crew leader's role in safety are discussed, as well as project planning, scheduling, and estimating. Includes performance tasks to assist the learning process.



# ELECTRICAL

## EL-101 Course

### COURSE OUTLINE

HOURS	MODULE	OBJECTIVE OUTLINE OF TRAINING
 2.5	No. 1	<b>Orientation to the Electrical Trade</b> An overview of the electrical trade and discusses the career paths available to electricians.
 10	No. 2	<b>Electrical Safety</b> Covers safety rules and regulations for electricians, including precautions for electrical hazards found on the job. Also covers the OSHA-mandated lockout/tagout procedure.
 7.5	No. 3	<b>Introduction to Electrical Circuits</b> Introduces electrical concepts used in Ohm's law applied to DC series circuits. Covers atomic theory, electromotive force, resistance, and electric power equations.
 7.5	No. 4	<b>Electrical Theory</b> Introduces series and parallel, circuits. Covers resistive circuits, Kirchhoff's voltage and current laws, and circuit analysis.
 7.5	No. 5	<b>Introduction to the National Electrical Code</b> Provides a road map for using the NEC®. Introduces the layout and the types of information found within the code book. Allows trainees to practice finding information using an easy-to-follow procedure.
 10	No. 6	<b>Device Boxes</b> Covers the hardware and systems used by an electrician to mount and support boxes, receptacles, and other electrical components. Also covers NEC® fill and pull requirements for device, pull, and junction boxes under 100 cubic inches.
 10	No. 7	<b>Hand Bending</b> Introduces conduit bending and installation. Covers the techniques for using hand-operated and step conduit benders, as well as cutting, reaming, and threading conduit.
 20	No. 8	<b>Raceways and Fittings</b> Introduces the types and applications of raceways, wireways, and ducts. Stresses the applicable NEC® requirements.
 10	No. 9	<b>Conductors and Cables</b> Focuses on the types and applications of conductors and covers proper wiring techniques. Stresses the applicable NEC® requirements.
 7.5	No. 10	<b>Basic Electrical Construction Drawings</b> Describes electrical prints, drawings, and symbols, and the types of information that can be found on schematics, one-lines, and wiring diagrams.
 15	No. 11	<b>Residential Electrical Services</b> Covers the electrical devices and wiring techniques common to residential construction and maintenance. Allows trainees to practice making service calculations. Stresses the applicable NEC® requirements.
 5	No. 12	<b>Electrical Test Equipment</b> Proper selection, inspection, and use of common electrical test equipment, including voltage testers, clamp-on ammeters, ohmmeters, multimeters, phase/motor rotation testers, and data recording equipment. Also covers safety precautions and meter category ratings.



### ELECTRICAL

### DURATION



**112.5 HOURS**  
**4 WEEKS**

THEORY  
**57%**

PERFORMANCE  
**43%**



## ELECTRICAL

### DURATION



**145 HOURS  
5 WEEKS**

THEORY **66%**

PERFORMANCE **34%**

# ELECTRICAL

## EL-102 Course

### COURSE OUTLINE

HOURS	MODULE	OBJECTIVE OUTLINE OF TRAINING
 <b>17.5</b>	No. 1	<b>Alternating Current</b> Describes forces that are characteristic of alternating-current systems and the application of Ohm's law to AC circuits.
 <b>20</b>	No. 2	<b>Motors: Theory and Application</b> Covers AC and DC motors, including the main components, circuits, and connections.
 <b>15</b>	No. 3	<b>Electric Lighting</b> Introduces principles of human vision and the characteristics of light. Focuses on the handling and installation of various types of lamps and lighting fixtures.
 <b>15</b>	No. 4	<b>Conduit Bending</b> Covers bends in conduit up to 6 inches. Focuses on mechanical, hydraulic, and electrical benders.
 <b>12.5</b>	No. 5	<b>Pull and Junction Boxes</b> Explains how to select and size pull boxes, junction boxes, and handholes.
 <b>10</b>	No. 6	<b>Conductor Installations</b> Covers the transportation, storage, and setup of cable reels; methods of rigging; and procedures for complete cable pulls in raceways and cable trays.
 <b>7.5</b>	No. 7	<b>Cable Tray</b> Focuses on NEC® installation requirements for cable tray, including cable installations.
 <b>7.5</b>	No. 8	<b>Conductor Terminations and Splices</b> Describes methods of terminating and splicing conductors, including preparing and taping conductors.
 <b>15</b>	No. 9	<b>Grounding and Bonding</b> Focuses on the purpose of grounding and bonding electrical systems. Thoroughly covers NEC® requirements.
 <b>12.5</b>	No. 10	<b>Circuit Breakers and Fuses</b> Describes fuses and circuit breakers along with their practical applications. Also covers sizing.
 <b>12.5</b>	No. 11	<b>Control Systems and Fundamental Concepts</b> Gives basic descriptions of various types of contactors and relays along with their practical applications.



# ELECTRICAL

## EL-103 Course

### COURSE OUTLINE

HOURS	MODULE	OBJECTIVE OUTLINE OF TRAINING
 17.5	No. 1	<b>Load Calculations – Branch and Feeder Circuits</b> Explains how to calculate branch circuit and feeder loads for residential and commercial applications.
 15	No. 2	<b>Conductor Selection and Calculations</b> Covers the factors involved in conductor selection, including insulation types, current-carrying capacity, temperature ratings, and voltage drop.
 12.5	No. 3	<b>Practical Applications of Lighting</b> Describes specific types of incandescent, fluorescent, and HID lamps, as well as ballasts. Also covers troubleshooting and various types of lighting controls.
 15	No. 4	<b>Hazardous Locations</b> The NEC® requirements for equipment installed in hazardous locations.
 25	No. 5	<b>Overcurrent Protection</b> Explains how to size and select circuit breakers and fuses for various applications. Also covers short circuit calculations and troubleshooting.
 12.5	No. 6	<b>Distribution Equipment</b> Discusses switchboards and switchgear, including installation, grounding, and maintenance requirements. Includes a set of drawings.
 12.5	No. 7	<b>Transformers</b> Discusses transformer types, construction, connections, protection, and grounding.
 10	No. 8	<b>Commercial Electrical Services</b> Covers the components, installation considerations, and NEC® requirements for commercial services.
 12.5	No. 9	<b>Motor Calculations</b> Covers calculations required to size conductors and overcurrent protection for motor applications.
 10	No. 10	<b>Voice, Data, and Video</b> Covers installation, termination, and testing of voice, data, and video cabling systems.
 12.5	No. 11	<b>Motor Controls</b> Provides information on selecting, sizing, and installing motor controllers. Also covers control circuit pilot devices and basic relay logic.



### ELECTRICAL

### DURATION



**155 HOURS  
5 WEEKS**

THEORY  
**66%**

PERFORMANCE  
**34%**





## ELECTRICAL

### DURATION



**182.5 HOURS  
5 WEEKS**

THEORY **76%**  
PERFORMANCE **24%**

# ELECTRICAL

## EL-104 Course

### COURSE OUTLINE

HOURS	MODULE	OBJECTIVE OUTLINE OF TRAINING
 <b>20</b>	No. 1	<b>Load Calculations – Feeders and Services</b> Topics include basic calculation procedures for commercial and residential applications.
 <b>10</b>	No. 2	<b>Health Care Facilities</b> Covers the installation of electric circuits in health care facilities, including the requirements for life safety and critical circuits.
 <b>10</b>	No. 3	<b>Standby and Emergency Systems</b> Explains the NEC® requirements for electric generators and storage batteries.
 <b>10</b>	No. 4	<b>Basic Electronic Theory</b> Explains the function and operation of basic electronic devices, including semiconductors, diodes, rectifiers, and transistors.
 <b>15</b>	No. 5	<b>Fire Alarm Systems</b> Fire alarm control units, Digital Alarm Communicator Systems (DACS), wiring for alarm initiating and notification devices, and alarm system maintenance.
 <b>10</b>	No. 6	<b>Specialty Transformers</b> Covers various types of transformers and their applications. Also provides information on selecting, sizing, and installing these devices.
 <b>20</b>	No. 7	<b>Advanced Controls</b> Discusses applications and operating principles of solid-state controls, reduced-voltage starters, and adjustable frequency drives. Also covers basic troubleshooting procedures.
 <b>15</b>	No. 8	<b>HVAC Controls</b> Provides a basic overview of HVAC systems and their controls. Also covers electrical troubleshooting and NEC® requirements.
 <b>10</b>	No. 9	<b>Heat Tracing and Freeze Protection</b> Covers heat tracing systems along with their applications and installation requirements.
 <b>10</b>	No. 10	<b>Motor Operation and Maintenance</b> Motor cleaning, testing, and preventive maintenance. Also describes basic troubleshooting procedures.
 <b>10</b>	No. 11	<b>Medium-Voltage Terminations/Splices</b> Offers an overview of the NEC® and cable manufacturers' requirements for medium-voltage terminations and splices.
 <b>20</b>	No. 12	<b>Special Locations</b> Describes NEC® requirements for selecting and installing equipment, enclosures, and devices in special locations including places of assembly, theaters, carnivals, agricultural buildings, marinas, temporary installations, wired partitions, and swimming pools.
 <b>22.5</b>	No. 13	<b>Fundamentals of Crew Leadership</b> Covers basic leadership skills and explains different leadership styles, communication, delegating, and problem solving. Jobsite safety and the crew leader's role in safety are discussed, as well as project planning, scheduling, and estimating. Includes performance tasks to assist the learning processes.

# PLUMBING

## PL-101 Course

### COURSE OUTLINE

HOURS	MODULE	OBJECTIVE OUTLINE OF TRAINING
 5	No. 1	<b>Introduction to the Plumbing Profession</b> Introduces trainees to career options in the plumbing profession. Provides a history of plumbing; discusses current technology, industries, and associations of the plumbing profession. Reviews human relations and safety skills.
 22.5	No. 2	<b>Plumbing Safety</b> Discusses the causes of accidents and their consequences including delays, increased expenses, injury, and loss of life. Reviews the types and proper use of personal protective equipment (PPE). Explains the use of critical safety information including HazCom, safety signs, signals, lockout/tagout, and emergency response. Covers confined-space safety, and reviews safety issues related to hand and power tools.
 10	No. 3	<b>Tools of the Plumbing Trade</b> Care and use of hand and power tools trainees will use on the job; selecting appropriate tools for different tasks, tool maintenance and safety issues.
 12.5	No. 4	<b>Introduction to Plumbing Math</b> Basic math concepts, such as whole numbers, fractions, decimals and squares; demonstrates how they apply to on-the-job situations. How to measure pipe using fitting tables/framing squares and calculating 45-degree offsets.
 17.5	No. 5	<b>Introduction to Plumbing Drawings</b> Discusses different types of plumbing drawings and how to interpret and apply them when laying out and installing plumbing systems. Explains the symbols used in plumbing and mechanical drawings, and reviews isometric, oblique, orthographic, and schematic drawings. Requires trainees to render plumbing drawings and to recognize how code requirements apply to plumbing drawings.
 12.5	No. 6	<b>Plastic Pipe and Fittings</b> Introduces different types of plastic pipe and fittings used in plumbing applications, including ABS, PVC, CPVC, PE, PEX, and PB. Describes how to measure, cut, join, and support plastic pipe according to the manufacturer's instructions and applicable codes. Discusses pressure testing of plastic pipe once installed.
 12.5	No. 7	<b>Copper Tube and Fittings</b> Discusses sizing, labeling, and applications of copper pipe and fittings, and reviews the types of valves that can be used on copper pipe systems. Explains proper methods for cutting, joining, and installing copper pipe. Addresses insulation, pressure testing, seismic codes, and handling and storage requirements.
 12.5	No. 8	<b>Cast-Iron Pipe and Fittings</b> Introduces hub-and-spigot and no-hub cast-iron pipe and fittings and their applications in DWV systems. Reviews material properties, storage and handling requirements, and fittings and valves. Covers joining methods, installation, and testing.
 12.5	No. 9	<b>Carbon Steel Pipe and Fittings</b> Discusses threading, labeling, and sizing of steel pipe and reviews the differences between domestic and imported pipe. Covers the proper techniques for measuring, cutting, threading, joining, and hanging steel pipe. Also reviews corrugated stainless steel tubing.
 7.5	No. 10	<b>Introduction to Plumbing Fixtures</b> Discusses the proper applications of code-approved fixtures in plumbing installations. Reviews the different types of fixtures and the materials used in them. Covers storage, handling, and code requirements.
 10	No. 11	<b>Introduction to Drain, Waste, and Vent (DWV) Systems</b> Explains how DWV systems remove waste safely and effectively. Discusses how system components, such as pipe, drains, traps, and vents work. Reviews drain and vent sizing, grade, and waste treatment. Discusses how building sewers and sewer drains connect the DWV system to the public sewer system.
 10	No. 12	<b>Introduction to Water Distribution Systems</b> Identifies the major components of water distribution systems and describes their functions. Reviews water sources and treatment methods, and covers supply and distribution for the different types of systems that trainees will install on the job.



### PLUMBING

### DURATION



**145 HOURS  
5 WEEKS**



**THEORY  
60%**



**PERFORMANCE  
40%**





## PLUMBING

### DURATION



**175 HOURS  
5 WEEKS**



**THEORY  
40%**



**PERFORMANCE  
60%**

# PLUMBING

## PL-102 Course

### COURSE OUTLINE

HOURS	MODULE	OBJECTIVE OUTLINE OF TRAINING
 <b>15</b>	No. 1	<b>Plumbing Math Two</b> Explains the Pythagorean theorem and reviews methods for laying out square corners. Discusses the techniques used to calculate simple and rolling offsets, as well as offsets on parallel runs of pipe.
 <b>25</b>	No. 2	<b>Reading Commercial Drawings</b> How to identify/interpret civil, architectural, structural, HVAC/mechanical, plumbing, and electrical drawings. How to ensure accurate dimensions, generate RFIs, and locate plumbing entry points, and how to establish piping routes and fixture locations. Isometric drawings, material takeoffs, approved submittal data, and Building Information Management (BIM), are also covered.
 <b>15</b>	No. 3	<b>Structural Penetrations, Insulation, and Fire-Stopping</b> Introduces methods for adjusting structural members, insulating pipe, and installing fire-stopping. Reinforcement techniques for modified structural members; how to measure/cut/install fiberglass and flexible foam insulation; and how to identify walls, floors, and ceilings that require fire-stopping.
 <b>30</b>	No. 4	<b>Installing and Testing DWV Piping</b> How to locate, install, connect, and test a complete drain, waste and vent (DWV) system. Discusses how to develop material takeoffs, set up and use levels, locate building sewers/drains, locate fixtures and test a DWV system.
 <b>5</b>	No. 5	<b>Installing Roof, Floor, and Area Drains</b> Proper techniques for locating/installing/connecting roof, floor, and area drains floor sinks according to code. Discusses waterproof membranes and flashing, drain components, shower pans, trap primers, and proper drain applications.
 <b>20</b>	No. 6	<b>Installing and Testing Water Supply Piping</b> Proper techniques for locating/installing/testing complete water service and distribution systems including meters, water heaters, water softeners and hose bibbs. Basic backflow and water hammer prevention; the installation of shower and tub valves, ice maker and washing machine boxes, pipe stub outs/supports.
 <b>5</b>	No. 7	<b>Types of Valves</b> Types of valves, components and applications. Also covers valve servicing.
 <b>20</b>	No. 8	<b>Installing Fixtures and Valves</b> Installation of basic plumbing fixtures including bathtubs, shower stalls, lavatories, sinks, water closets and urinals. Reviews the installation of associated valves, faucets, and components. How to connect appliances such as dishwashers, food-waste disposers, refrigerators and ice makers, and washing machines.
 <b>10</b>	No. 9	<b>Installing Water Heaters</b> Discusses gas-fired, electric, tankless, heat pump, and indirect water heaters, components, and applications. Reviews proper installation/testing techniques and covers the latest code requirements for water heaters.
 <b>10</b>	No. 10	<b>Basic Electricity</b> Electrical safety and the principles of electricity including voltage, current, resistance and power. Includes important electrical formulas, circuitry, and common plumbing-related electrical applications.
 <b>20</b>	No. 11	<b>Fuel Gas and Fuel Oil Systems</b> Introduces techniques for safe handling of natural gas, liquefied petroleum gas, and fuel oil. Reviews fuel gas and fuel oil safety precautions and potential hazards, applications, systems installation and testing.



# PLUMBING

## PL-103 Course

### COURSE OUTLINE

HOURS	MODULE	OBJECTIVE OUTLINE OF TRAINING
 17.5	No. 1	<b>Applied Math</b> Reviews math concepts, including weights and measures, area and volume, temperature, pressure, and force. Describes the six simple machines: inclined planes, levers, pulleys, wedges, screws, and wheels and axles.
 30	No. 2	<b>Sizing and Protecting the Water Supply System</b> Teaches techniques for sizing water supply systems, including calculating system requirements and demand, developed lengths, and pressure drops. Reviews the factors that can reduce efficiency of water supply piping. Introduces different backflow prevention devices and explains how they work, where they are used, and how they are installed in water supply systems.
 15	No. 3	<b>Potable Water Supply Treatment</b> Explains how to disinfect, filter, and soften water supply systems. Discusses how to troubleshoot water supply problems, flush out visible contaminants from a plumbing system, and disinfect a potable water plumbing system.
 20	No. 4	<b>Types of Venting</b> Reviews the different types of vents that can be installed in a DWV system and explains how they work. Teaches design and installation techniques.
 20	No. 5	<b>Sizing DWV and Storm Systems</b> Explains how to calculate drainage fixture units for waste systems. Reviews how to size drain, waste, and vent (DWV) systems; storm drainage systems; and roof storage and drainage systems.
 12.5	No. 6	<b>Sewage Pumps and Sump Pumps</b> Explains the installation, diagnosis, and repair of pumps, controls, and sumps in sewage and storm water removal systems.
 7.5	No. 7	<b>Corrosive-Resistant Waste Piping</b> Discusses corrosive wastes and reviews related safety issues and hazard communications. Explains how to determine when corrosive-resistant waste piping needs to be installed, as well as how to correctly select and properly connect different types of piping.
 10	No. 8	<b>Compressed Air</b> Explains the principles of compressed air systems and describes their components and accessories. Reviews installation and periodic servicing of air compressor systems.
 27.5	No. 9	<b>Service Plumbing</b> Covers the troubleshooting and repair of fixtures, valves, and faucets in accordance with code and safety guidelines. Explains how to diagnose and repair water supply and drainage piping, water heaters, and other appliances and fixtures. Describes the effects of corrosion, freezing, and hard water on plumbing systems.



### PLUMBING

### DURATION



**160 HOURS**  
**5 WEEKS**

THEORY  
**58%**

PERFORMANCE  
**42%**





## PLUMBING

### DURATION



**145 HOURS  
5 WEEKS**

**THEORY**  
**75%**

**PERFORMANCE**  
**25%**

# PLUMBING

## PL-104 Course

### COURSE OUTLINE

HOURS	MODULE	OBJECTIVE OUTLINE OF TRAINING
 <b>15</b>	No. 1	<b>Business Principles for Plumbers</b> Introduces concepts and practices essential for competitive, successful plumbing businesses. Also covers basic business accounting and project estimating, as well as techniques for cost control and task organization.
 <b>20</b>	No. 2	<b>Fundamentals of Crew Leadership</b> Basic leadership skills and explains different leadership styles, communication, delegating, and problem solving. Jobsite safety and the crew leader's role in safety are discussed, as well as project planning, scheduling, and estimating. Includes performance tasks to assist the learning process.
 <b>12.5</b>	No. 3	<b>Water Pressure Booster and Recirculation Systems</b> Builds on trainees' previous experience with pumps, storage tanks, controls, and pipes and fittings by teaching how to assemble those components into systems that boost water pressure and provide hot water.
 <b>17.5</b>	No. 4	<b>Indirect and Special Waste</b> Describes the code requirements and installation procedures for systems that protect against contamination from indirect and special waste.
 <b>17.5</b>	No. 5	<b>Hydronic and Solar Heating Systems</b> Introduces the basic types of hydronic and solar heating systems and their components. Reviews hydronic and solar heating system layout, installation, testing, and balancing, and also discusses methods that inhibit corrosion in hydronic or solar heating systems.
 <b>12.5</b>	No. 6	<b>Codes</b> Discusses the different codes used by plumbers across the country and explains how those codes are written, adopted, modified, and implemented.
 <b>10</b>	No. 7	<b>Private Water Supply Well Systems</b> Describes the operation of pumps and well components. Reviews the qualities of good wells and how to assemble and disassemble pumps and components.
 <b>10</b>	No. 8	<b>Private Waste-Disposal Systems</b> Describes the types of private waste-disposal systems, discusses the maintenance and installation of these systems, and explains how to determine the local code requirements for these systems. Covers percolation tests and sewage system planning and layout.
 <b>7.5</b>	No. 9	<b>Swimming Pools and Hot Tubs</b> Introduces trainees to plumbing systems in swimming pools, hot tubs, and spas.
 <b>7.5</b>	No. 10	<b>Plumbing for Mobile Homes and Travel Trailer Parks</b> Describes the location and layout of plumbing systems for mobile home and travel trailer parks. Reviews how to design and lay out a system, how to connect water and sewer lines to a mobile home, and how to estimate materials for the park.
 <b>15</b>	No. 11	<b>Introduction to Medical Gas and Vacuum Systems</b> Introduces the various types of medical gas and vacuum systems used in health care facilities. Covers the system requirements and professional qualifications required by code, describes common types of medical gas and vacuum systems, and introduces the safety requirements for installing, testing, and servicing these systems.

# APPLIANCE REPAIR

## Major Appliance | MA-100 Course

### COURSE OUTLINE

HOURS	MODULE	OBJECTIVE OUTLINE OF TRAINING
 <b>21</b>	No. 1	<b>Occupational Skill</b> Describes safety in appliance servicing; customer relations; Identify tools; accounting; business introduction; estimating jobs.
 <b>70</b>	No. 2	<b>Electrical</b> Describes electrical principles; household wiring; Utilize electrical test equipment; Explains the laws of electromagnetism; Identify electric motors; Demonstrate troubleshooting with wiring schematics.
 <b>28</b>	No. 3	<b>Electronics</b> Solid state components; Build power supplies and electrical filter systems; Describes sine wave and rectification.
 <b>35</b>	No. 4	<b>Ancillary Products</b> Principles and operation of garbage disposals, perform services on garbage disposals, describe principles and operation of trash compactors; Perform services on trash compactors; Describes principles and operation of electric water heaters; Perform services on electric water heaters.
 <b>35</b>	No. 5	<b>Electrical Dryers</b> Explains electric dryers' installation; Service dryers; Diagnosis of dryer cycles; troubleshooting; parts look-up.
 <b>35</b>	No. 6	<b>Electrical Ranges</b> Explains electric range installation; Service ranges; Diagnosis of ranges; repair of ranges; troubleshooting; parts look-up.
 <b>70</b>	No. 7	<b>Automatic Washers Top/Front Load</b> Explains electric washer installation; Service washers; Diagnosis of wash cycles; Repair of washers; troubleshooting; parts look-up.
 <b>35</b>	No. 8	<b>Automatic Electric Dishwashers</b> Explains electric dishwasher installation; Service dishwashers; Diagnosis of wash cycles; troubleshooting; parts look-up.
 <b>168</b>	No. 9	<b>Domestic Refrigeration and Air Conditioning</b> Obtain CFC refrigerant certification; refrigeration and air-conditioning principles and installation; Service domestic refrigeration/domestic air conditioning; troubleshooting; parts look up; brazing/LOKRING connectors.
 <b>14</b>	No. 10	<b>Microwave Technologies</b> Describes microwave installations; Perform microwave service; Perform microwave repairs; troubleshooting; parts look-up.
 <b>70</b>	No. 11	<b>Gas Appliances</b> Ranges, Dryers, & Water Heater: Describes the operation of gas pressure regulators; Describes atmospheric burner operation; Calculate venting requirements; Perform gas appliance services; Perform gas appliance repairs; troubleshooting; parts look-up.
 <b>28</b>	No. 12	<b>Hydrocarbons</b> Describes procedures, safety; Perform procedures; Perform repair systems.
 <b>7</b>	No. 13	<b>Electrical Code</b> Explains the requirements for portable appliances.
 <b>7</b>	No. 14	<b>Gas Code</b> The requirement for hooking portable appliances. Describes btu requirements for portable appliances; Define the function of the Gas Safety Branch; Define Gas Code/Regulations pertaining to permits, license and inspections; Define safety practices of natural/propane gases; Apply regulations/safety practices.



### APPLIANCE REPAIR

#### DURATION



**630 HOURS  
18 WEEKS**



**EXAMS:  
7 HOURS**





## APPLIANCE REPAIR

### DURATION



**120 HOURS  
5 WEEKS**

THEORY  
**53%**

PERFORMANCE  
**47%**



# APPLIANCE REPAIR

## Light Commercial Refrigeration HV-LC-302 Course








**COURSE OUTLINE**

HOURS	MODULE	OBJECTIVE OUTLINE OF TRAINING
 <b>30</b>	No. 1	<b>Refrigeration Basics</b> This Module is designed to present a working foundation of refrigeration, theory and application, flaring Swaging & Brazing safety plus an introduction knowledge of electrical and reading of schematic wiring diagrams. The concept of single-phase and three-phase electrical power, refrigeration cycles and its components, the characteristics of refrigerant blends and oils, and the different temperature applications will be covered. Also, this module will prepare students for the EPA section 608 exam (Refrigeration Certification). The instructor will review all material needed to receive their EPA Universal Certification: Core, Type I, Type II, and Type III.
 <b>40</b>	No. 2	<b>Electrical Controls &amp; Refrigeration Components</b> This module covers the functions and designs of the major components in a light commercial refrigeration application. Compressors, evaporators, metering devices, Receiver, filter driers, moisture indicators, and service ports are discussed in this module. Students will learn the operation, design, and functions of mechanical, electronic/electronic pressures, and defrost controls in a light commercial application. Evaporator pressure controls, crankcase pressure regulators, defrost timers, and defrost termination/fan delays will also be covered.  This Module covers the safety and procedures of Hydrocarbon refrigerants. Throughout the world, concerns are growing about global warming and the effect of harmful atmospheric emissions. In response to these concerns, manufacturers are utilizing more and more alternative refrigerants such as hydrocarbons. Hydrocarbon refrigerants are natural, nontoxic refrigerants that have no ozone-depleting properties and extremely low global warming potential. Hydrocarbon refrigerants, while being one of the most cost-effective and climate-friendly refrigerants, are also extremely flammable and require specialized equipment and training to handle them safely.
 <b>40</b>	No. 3	<b>Refrigerants Types and Applications</b> In response to increased usage of hydrocarbon refrigerants, Virginia Technical Academy developed a course that would assist technicians in understanding the safety requirements for servicing systems that contain EPA approved flammable refrigerants. As a LOKRING distributor and certified trainer, we also provide technicians with a safe alternative to brazing sealed systems. LOKRING ensures an absolutely clean, permanent and purely mechanical tube connection, with long-term hermetic gas-tightness and has become the standard of major manufacturers for repairing sealed systems.
 <b>40</b>	No. 4	<b>Application of Refrigeration Systems</b> This module will cover various light commercial applications. The design and function of light commercial refrigerators, light commercial freezers, walk-in coolers, walk-in freezers, ice makers, and domestic refrigerators will be covered.
 <b>30</b>	No. 5	<b>Domestic and Commercial Ice Makers</b> This module will cover the design and function of various domestic and commercial ice makers.



# FACILITIES MAINTENANCE FM-101 Course

## COURSE OUTLINE

HOURS	MODULE	OBJECTIVE OUTLINE OF TRAINING
 10	No. 1	<b>OSHA 10- Construction</b> This OSHA 10-Hour Construction course covers a broad spectrum of valuable health and safety workplace topics that will familiarize you with OSHA Construction standards. These topics will include the OSHA Construction Focus Four, identifying common worksite hazards, tool operation and more.
 28	No. 2	<b>Wall Systems</b> Describes procedures for laying out and framing walls, including roughing-in door and window openings, constructing corners, partition Ts, and bracing walls. Includes the procedure to estimate the materials required to frame wall.
 16	No. 3	<b>Drywall Finishing</b> Describes the materials, tools and methods used to finish and patch gypsum drywall. A discussion of both automatic and manual taping and finishing tools is presented.
 16	No. 4	<b>Doors and Door Hardware</b> Describes the installation of metal doors and related hardware in steel-framed, wood-framed, and masonry walls, along with their related hardware, such as locksets and door closers. A discussion on the installation of wood doors, folding doors, and pocket doors is also presented.
 40	No. 5	<b>Appliance Repair and Replacement</b> Demonstrate the proper use of electrical test equipment to measure the following: AC & DC voltage; AC & DC current; Resistance; Insulation resistance to ground; Open, shorted, and grounded circuits.
 24	No. 6	<b>Installing Fixtures and Valves</b> Describes the installation install basic plumbing fixtures, including bathtubs, shower stalls, lavatories, sinks, water closets, and urinals; reviews the installation of associated valves, faucets, and components; and discusses how to connect appliances such as dishwashers, food-waste disposers, refrigerators, and ice makers, and washing machines.
 16	No. 7	<b>Basic Employability Skills</b> Introduces trainees to critical thinking and problem solving, skills. Reviews effective relationship skills, effective self-presentation, and key workplace issues such as sexual harassment, stress, and substance abuse. Also presents information on computer systems and their industry applications.



## FACILITIES MAINTENANCE

### DURATION



**150 HOURS  
5 WEEKS**

THEORY  
  
**54%**

PERFORMANCE  
  
**46%**





## FACILITIES MAINTENANCE

### DURATION







**150 HOURS  
4 WEEKS**

THEORY  
**62%**

PERFORMANCE  
**38%**

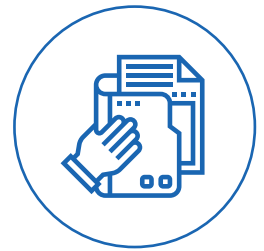
# FACILITIES MAINTENANCE FM-102 Course

## COURSE OUTLINE

HOURS	MODULE	OBJECTIVE OUTLINE OF TRAINING
 <b>72</b>	No. 1	<b>Heating and Airconditioning</b> This course is designed to present a working foundation of refrigeration, air conditioning and heat pump theory and application, plus a basic knowledge of electrical troubleshooting and reading of schematic wiring diagrams.
 <b>38</b>	No. 2	<b>Residential Electrical Services</b> Covers the electrical devices and wiring techniques common to residential construction and maintenance. Allows trainees to practice making service calculations. Stresses the applicable NEC® requirements.
 <b>20</b>	No. 3	<b>Roofing Applications</b> Describes how to properly prepare the roof deck and install roofing for residential and commercial buildings.
 <b>20</b>	No. 4	<b>Exterior Finishing</b> Covers the various types of exterior finish materials and their installation procedures, including wood, metal, vinyl, and fiber-cement siding.



LEARN.  
APPLY.  
THRIVE.



## TRAINING & CERTIFICATION COURSES

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**APPLY  
TODAY**

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## HVAC TRAINING COURSES

### DURATION



**80 HOURS  
14 WEEKS**

## TECHNICIAN TRAINING COURSES

# HVAC HV-201 Course

This **80-hour, 14-week course** is designed to present a working foundation of:

- **Refrigeration:**  
This subject introduces students to the fundamentals and basic refrigeration cycle.
- **Tools & Supplies:**  
Students will learn the tools, instruments, and supplies most commonly used in HVAC repair.
- **Tubing & Piping:**  
Students will receive hands-on training on various tubing and piping connecting procedures using approved methods.
- **Equipment & Instruments for Refrigerant Handling & Services:**  
Students will learn the specialized equipment used to handle refrigerants, perform refrigerant system service, and pull a vacuum.
- **Working with Refrigerant:**  
Students will get hands-on training in checking refrigerant charge, repairing refrigerant leaks, evacuating a system.
- **Basic Electricity:**  
Students will learn how to calculate power in a circuit, and how factors affect a circuit's power.

This course involves a combination of:



**Classroom  
Instruction**



**Hands-on  
Training**



**Trouble Shooting  
& Repair**



**Diagram  
Reading**



**EPA  
Certification**

# HVAC Electrical Controls HV-202 Course

This **80-hour, 14-week course** is designed to present a blend of electrical theory and practice suitable for the apprentice level or experienced technician who wishes to improve his or her knowledge and skills.

STUDENTS WILL BE PROVIDED WITH A SOUND FOUNDATION IN:

- Electrical safety and theory
- The operational function of electrical control devices
- Interpreting schematics and wiring diagrams
- Troubleshooting methods

The mastery of this material will reduce downtime and expenses caused by equipment failures and increase the overall efficiency of operations in the facility.

This course involves a combination of:



**Classroom  
Instruction**



**Hands-on  
Training**



**Trouble Shooting  
& Repair**



**Diagram  
Reading**

TECHNICIAN  
TRAINING COURSES

# HVAC

## HV-203 Course

This **80-hour course** provides a more hands-on experience to the concepts learned previously in HVAC 101 & Electrical Controls.

STUDENTS WILL COMPLETE NUMEROUS LAB PROJECTS TO GAIN PROFICIENCY WITH:

- Residential air conditioning
- Air movement distribution
- Ventilation theory
- Mechanical and electrical troubleshooting



**PREREQUISITES:**  
**HVAC 101, ELECTRICAL CONTROL 101,**  
**OR PASS PRE-QUALIFYING EXAM.**

This course involves a combination of:



**Classroom  
Instruction**



**Hands-on  
Training**



**Trouble Shooting  
& Repair**



**Diagram  
Reading**



**410A Safety  
Certification**



### HVAC TRAINING COURSES

#### DURATION



**80 HOURS  
13 WEEKS**

# HVAC

## Hydrocarbons HV-HC-304 Course

This course is designed to present appliance technicians with safety information and best practices for working with approved flammable refrigerants.

THIS COURSE IS MADE UP OF **TWO 8 HOUR UNITS** OF INSTRUCTION.

- **Unit 1:** Hydrocarbon Refrigerant Safety, is designed to provide technicians with an understanding of the safety requirements for servicing systems that contain EPA SNAP approved flammable refrigerants.
- **Unit 2:** LOKRING Service Training, is designed to provide technicians with an overview of the products available through American Vulkan Corporation and the endless applications for LOKRING solder-free tube connections. Students will participate in both classroom and hands-on training exercises to ensure mastery of the installation and servicing processes associated with LOKRING tube connections.

#### COURSE OBJECTIVES:

- Identify Uses of Hydrocarbons as Refrigerants
- Summarize hydrocarbon regulations and standards
- Identify refrigerant properties and safety
- Explain servicing procedures
- Summarize various LOKRING applications
- Assemble LOKRING tube connections

#### Applications



- **Commercial and residential refrigeration**
- **Refrigerators, freezers, wine fridges, and more**
- **Process suitable for all refrigerants (R-600, R-290, R-134a)**

#### DURATION



**16 HOURS  
( 2 UNITS )**



## HVAC TRAINING COURSES

### DURATION



**8 HOURS  
1 DAY**



## APPLIANCE REPAIR TRAINING COURSE

### DURATION



**40 HOURS  
3 DAYS**

## TECHNICIAN TRAINING COURSES

# HVAC Sealed Systems HV-SS-305 Course

This **8-hour course** will train technicians with hands-on proper procedures to access and repair the sealed systems of domestic refrigerators and freezers.

### COURSE OBJECTIVES:

- Review the refrigeration basic cycle
- Component identification
- Accessing sealed systems
- Repairing sealed system components
- Recovery, evacuation and charging procedures
- Verifying system operation

### Applications



- Commercial and residential refrigeration
- Refrigerators, freezers, wine fridges, and more
- Process suitable for all refrigerants (R-600, R-290, R-134a)

# APPLIANCE REPAIR AP-TC-100 Course

This is a **three day, 24-hour course** designed to present a working foundation of the six standard household appliances: dryers, washing machines, refrigerators, dishwashers, microwaves, and ranges. Additionally, students will gain an understanding of both electrical schematics and wiring diagrams and how to utilize them in troubleshooting equipment.

### COURSE OBJECTIVES:

- Demonstrate the proper use of electrical test equipment to measure the following:
  - AC & DC voltage
  - AC & DC current
  - Resistance
  - Insulation resistance to ground
  - Open, shorted, and grounded circuits
- Identify the difference between wiring diagrams and electrical schematics
- Identify symbols on wiring diagrams and electrical schematics
- Identify common electrical / electronic components
- State the principles of operation for the 6 standard household appliances
- Troubleshoot 3 out of the 6 major appliances

In this course, you will learn to troubleshoot 3 out of 6 appliances below:



**Dryer**



**Washing Machine**



**Refrigerator**



**Dishwasher**



**Microwave**



**Range**

## CERTIFICATION COURSES

# EPA Section 608 Certification Course

This is a **one-day, 4-hour lecture** that will fully prepare you to become an EPA 608 Certified Universal technician. This course includes lecture, preparatory manual, and 2-hour exam. We also offer an exam-only option.

CONSISTS OF A LECTURE COVERING:

1. ....Core Section
2. ....Type I, appliances
3. ....Type II, low- and high-pressure systems
4. ....Type III, chillers and low-pressure systems

Course includes:



Lecture



Preparatory Manual



2 Hour Exam



**PLUS 4-PART EXAM FOR UNIVERSAL CERTIFICATION.**

# 410-A Safety Certification Course

This is a **2-day, 6-hour course** that will fully prepare you to achieve your R-410A Safety Certification. This course includes lecture, preparatory manual, and 3-hour exam. We also offer an exam-only option.

CONSISTS OF A LECTURE COVERING:

1. ....Safely service systems containing R-410A and R-407C
2. ....R-22 phase out
3. ....Appropriate refrigerant and oil applications
4. ....Service techniques
5. ....Safe handling of R-410A

Course includes:



Lecture



Preparatory Manual



3 Hour Exam



**PLUS 50-QUESTION EXAM FOR UNIVERSAL R-410A CERTIFICATION.**



## PROFESSIONAL CERTIFICATION COURSES

DURATION

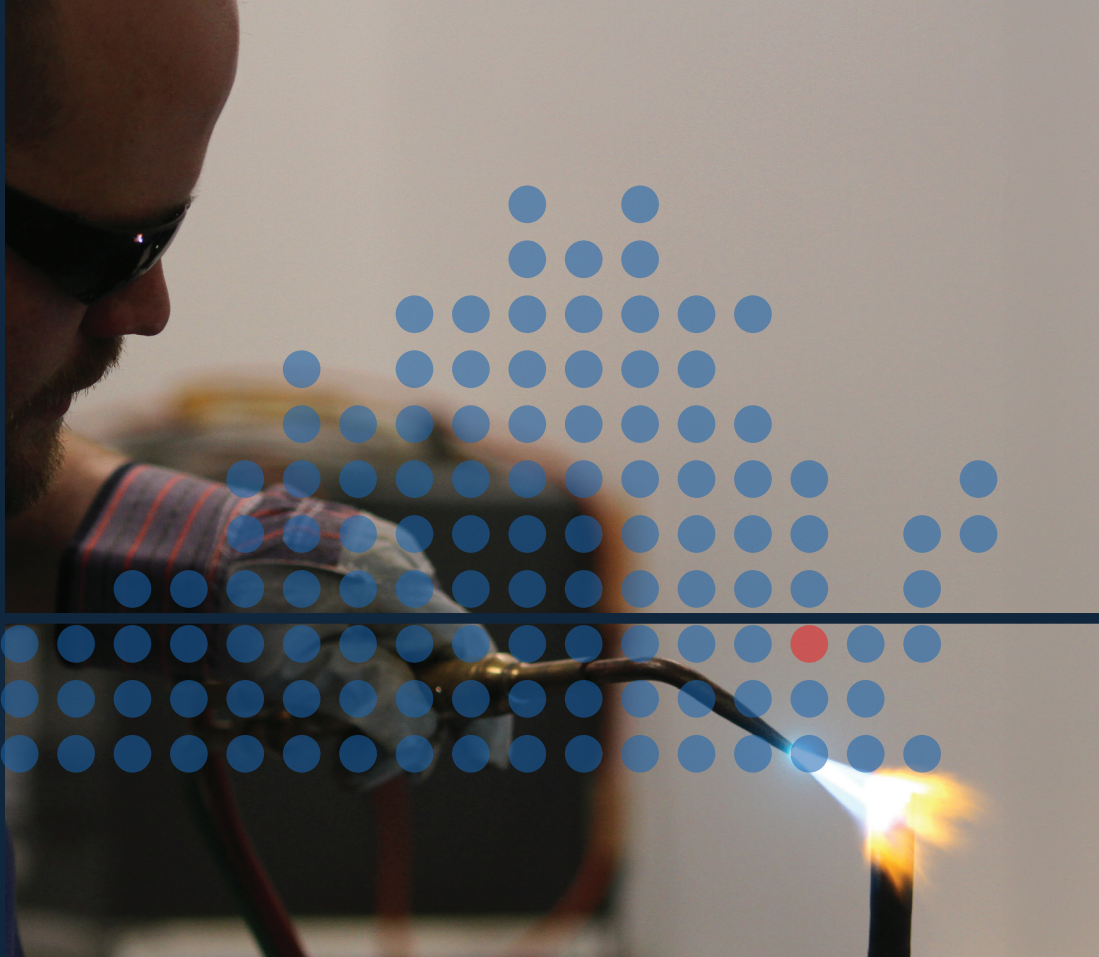


**4 HOURS  
1 DAY**

DURATION



**6 HOURS  
2 DAYS**



# LEARN. APPLY. THRIVE.

**APPLY  
TODAY** 

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**Virginia Technical Academy**

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**757-586-5322**