



SKILLTECH



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Adult Education at the Center for Technology, Essex

HVAC/R Technician Training Program

Overview

The HVAC/R Technician Training Program is designed to provide students the opportunity to develop knowledge, skills, and attitudes required of service technicians in the heating, ventilation, air conditioning, and refrigeration industry. Mainly targeted toward novice students in HVAC/R, apprenticeship, and adult continuing education classes, the instructional program and materials can serve as an excellent resource for technicians already working in the field. Sufficient engineering principles are included to explain essential troubleshooting and service procedures.

Students will have ample opportunity to fully acquaint themselves with the tools and equipment encountered in the field and the opportunity to apply newly learned skills on existing equipment in the school laboratory. An overview of cooling and refrigeration systems, electrical and motor controls, and heating systems will be delivered. The textbook and lab workbook supports instruction and hands-on experience.

Program Courses (168 hours)

- Tools and Applications (6 weeks)
- Cooling and Refrigeration Systems (10 weeks)
- Electricity, and Motor Controls (5 weeks)
- Heating Systems (7 weeks)

Industry Employment Supporters: Successful program completers will be connected with one or more industry partners for employment consideration. Current partners include:

Alliance Mechanical	Avonda Air Systems	Blodgett Supply	Bourne's Energy
Chuck's Heating and Ventilating	Climate Systems	Control Tech.	E&M Mechanical
Efficiency Vermont	FW Webb	Jay Mechanical,	Jack's Heating/AC,
New England Air Systems	St. Michael's Coll. Facilities	Vermont Energy	Vermont Gas
Vermont HV	Vermont Mechanical	Williamson P/H	

Post-secondary Education Partner: Successful program completers will receive a college-level technical certificate leading to post-secondary degree programs.

Vermont Technical College

Organizational Partners: The support of these partners enhances the quality, relevance and rigor of the program.

- Vermont Department of Labor
- Vermont Fuel Dealers Association

<u>Days/Times</u>	Tuesday and Thursday from 5:30 - 8:30 p.m. Begins Tuesday, September 4, 2018 for twenty-eight weeks.
<u>Earned Credentials</u>	Act 608 Technician Certification-Universal Vermont Technical College Non-degree Certificate
<u>Text Book</u>	Heating and Cooling Essentials, 4th Edition, Copyright: 2016
<u>Program Cost</u>	\$3,300 plus text books.
<u>Instructors</u>	Field professionals TBD
<u>Register</u>	https://www.ewsd.org/Page/4408
<u>Course Content</u>	See attached

SkillTech
HVAC/R Technician Training Program
Course Content

HVAC/R Tools and Applications (6 weeks)

- List the physical, mental, communication, and technical skills needed to be successful in HVAC/R.
- Select the proper hand tool for the job and demonstrate skill in its use.
- Demonstrate proper use of taps and dies.
- Identify and correctly use screw types and sizes, bolts, nuts, washers, various anchors, setscrews, blind rivets, and threaded rods.
- Select and properly use tubing and pipe tools to bend, swage, flare, and join using various methods.
- Select proper alloys and fluxes and safely perform soldering, brazing, and torch cutting processes.
- Work with fractions and decimals, take various measurements, convert between Fahrenheit and Celsius scales, use percentages to calculate profit margin on parts, and rearrange formulas for proper problem solving.
- Customer Service including handling arguments with customers, shaking hands properly, making a good first and lasting impression, and effectively deal with angry customers.

Refrigeration and Air Conditioning (10 Weeks)

- Define and distinguish sensible heat, specific heat, latent heat, saturated conditions, superheat, and subcooling.
- Use various thermometers and pressure gauges to take accurate measurements of temperature and pressure and use a saturation or pressure-temperature (P/T) chart.
- Properly identify and explain the purpose of each component in a refrigeration system.
- Recognize and identify different refrigerants, azeotropic mixtures, and zeotropic blends.
- Properly perform recovery, recycling, leak detection, evacuation, and charging procedures.
- Install, adjust or size, and troubleshoot automatic expansion valves, thermostatic expansion valves, capillary tubes, and metering orifices.
- Identify, install, adjust, and troubleshoot hand valves, check valves, solenoid valves, EPRs, CPRs, hot gas bypass valves, head pressure control valves, and receiver pressure regulators.
- Identify the three basic compressor designs, describe the operation of each type of compressor, properly align pulleys and flywheels, and select, size, and replace V-belts.
- Test for Act 608 Technician Certification-Universal.
- Select the proper lubricant for a system and add or remove the amount necessary.
- Interpret and use information from compressor data plates.

- Explain the operating principles of various types of chillers and absorption refrigeration systems.
- Customer Service including handling arguments with customers, shaking hands properly, making a good first and lasting impression, and effectively dealing with angry customers.

Electricity and Motor Controls (5 weeks)

- Describe the application of Ohm's Law, properly use electrical test meters, identify open circuits and short circuits, determine proper wire size and conductors for various uses, and connect loads and switches in electrical circuits, and connect appropriate transformers and circuit protectors.
- Describe the operation and application of induction motors, make proper wiring connections, and troubleshoot induction motor problems.
- Use and troubleshoot solenoid valves, relay circuits, contactors, and across-the-line starters.
- Read and use pictorial, schematic, and ladder diagrams.
- Identify, install, adjust, and troubleshoot primary motor controls (thermostatic and pressure), safety controls, and pumpdown cycles.
- Identify, install, and troubleshoot various domestic and commercial defrost timeclocks and related controls.
- Customer service including handling arguments with customers, shaking hands properly, making a good first and lasting impression, and effectively deal with angry customers.

Heating (7 weeks)

- Assemble, join, install, and repair all types of ductwork, registers, diffusers, grilles, insulation, and supports.
- Identify, install, wire, adjust, and troubleshoot the operating and control components of a gas heating system.
- Identify, install, wire, adjust, and troubleshoot the operating and control components of an oil heating system.
- Identify, install, wire, adjust, and troubleshoot the operating and control components of an electric heating system.
- Identify, install, wire, adjust, and troubleshoot the operating/control components of heat pump system.
- Customer service including handling arguments with customers, shaking hands properly, making a good first and lasting impression, and effectively dealing with angry customers.