



## HVAC Apprentice (50-401-9) Effective 2022/2023

### Program Description

HVAC Installation Technicians work with heating, air-conditioning and refrigeration systems that consist of many mechanical, electrical, and electronic components, including motors, compressors, pumps, boilers, fans, ducts, pipes, thermostats and switches. In central heating systems, a furnace or boiler heats air that is distributed throughout the building by a system of metal or fiberglass ducts or piping. Technicians must be able to maintain, diagnose, and correct problems throughout the entire system. They may adjust system controls to recommended settings and test the performance of the entire system using special tools and test equipment. The work involves installing ductwork and installing and wiring environmental control systems and testing and balancing air-handling equipment and hydronic and piping systems. They install, service, and repair heating and air conditioning systems in residences and commercial and industrial establishments. Apprentices will apply trade practices to residential, commercial, industrial and service.

### Program Learning Outcomes

Graduates will be able to:

1. Test pipe or tubing joints and connections for leaks, using pressure gauge or soap-and-water solution.
2. Test electrical circuits and components for continuity, using electrical test equipment.
3. Adjust system controls to settings recommended by the manufacturer to balance the system, using hand tools.
4. Discuss heating-cooling system malfunctions with users to isolate problems or to verify that malfunctions have been corrected.
5. Inspect and test system to verify system compliance with plans and specifications and to detect and locate malfunctions.
6. Repair or replace defective equipment, components, or wiring.
7. Reassemble and test equipment following repairs.
8. Record and report all faults, deficiencies, and other unusual occurrences, as well as the time and materials expended on work orders.
9. Comply with all applicable standards, policies, and procedures, including safety procedures and the maintenance of a clean work area.
10. Obtain and maintain required certifications.
11. Relate learning outcomes to trade practices in residential, commercial, industrial, and service.

### Essential Career Competencies

Gateway's six essential career competencies are the general attitudes and skills promoted and assessed by all programs. All Gateway graduates will develop skills in:

- Communication Competence
- Professionalism and Career Management
- Cultural Competence
- Critical Thinking and Problem Solving
- Teamwork and Collaboration
- Technology Competence

### Get Started as an Apprentice

1. Go to the ABC of WI Apprenticeship Office to pick up an application or fill out an application request online.
2. Achieve a passing score on algebra, arithmetic and reading portions of the Accuplacer test. The Accuplacer test is available at Gateway's Kenosha and Racine campuses and the cost is \$15. Contact the Testing Center to schedule an appointment at 262-564-2542.
3. You will receive a letter of introduction and a list of ABC of WI approved apprenticeship trainers for HVAC. Your letter of introduction should be presented to local ABC of WI approved apprenticeship trainers when applying for apprenticeship jobs.
4. You must find an ABC of WI-approved trainer to hire you before you can become an apprentice. Once hired, you will be invited to meet with the Apprenticeship Committee for final approval and to sign your contract.
5. Once your contract is in place Gateway's Apprenticeship department will communicate with you regarding registration, classes and books.

### Graduation Requirements

- \*Minimum of 2.0 ("C") or above for all required courses.
- Meet minimum hourly paid related instruction requirements per WI Registered Apprenticeship Contract.

### Notes

1. Students must be physically able to perform the job in hot or cold weather, differing heights and cramped spaces.
2. Students must be 18 years of age and submit official high school, GED, or HSED transcript including a graduation or passing date.
3. Students must complete all courses with a grade of "C" or better.
4. Students must have a valid driver's license.

Gateway Technical College reserves the right to modify curriculum requirements for students who interrupt enrollment for one year or take over seven years to complete. Tuition and material fees are determined by the board of the Wisconsin Technical College System. Consult My Gateway for exact fee amounts. Occasionally, the District may offer a particular course out of published sequence. By doing so, the District does not obligate itself to offer succeeding courses out of published sequence.



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The course sequence shown on this sheet is the recommended path to completion. Courses will be scheduled in the terms indicated here.  
Taking courses in the order shown will help you stay on track and graduate according to your academic plan.  
Courses in this program may be offered in a variety or combination of formats (for example: in-person, video conferencing, online, etc.).

### Pathway to Success

Course	Course Name	Credits	Hours
*401-501	Introduction to HVAC	1.1	40
*401-502	Tube and Piping Skills	1.1	40
*401-506	Forced Air Heating Intro to	1.1	40
*401-508	Cooling Fundamentals	1.1	40
*401-571	Mechanical Refrigeration Circuit	1.1	40
*401-570	Ductwork Construction & Airside Basics	1.1	40
*401-569	Alternating Current and PM Basics	1.1	40
*401-568	Venting & Introduction to Hydronics	1.1	40
*401-566	Troubleshooting HVAC Systems	1.1	40
*401-567	Hydronics & Steam Systems	1.1	40
*401-565	Refrigerant; Advanced Topics	1.1	40
*401-564	Heat Pumps	1.1	40
*401-563	IAQ/DDC Controls & Air Balancing	1.1	40
*401-562	Commercial Concepts, Advanced	1.1	40
*401-560	Comm/Ind Refrigeration & Alt. Systems	1.1	40
*401-561	Heating & Cooling Design	1.1	40

### Training at a Glance

- Time to complete – Approximately 5 years
- On the job time – 8440 Hours
- Related Instruction Time – 640 Hours
- Additional training – Valid credential issued by WI Dept of Safety and Professional Services; First Aid and CPR certifications; Complete unpaid related instruction; Transition to Trainer
- Consult the Wisconsin Bureau of Apprenticeship Standards website for more information

If you need assistance getting started, Gateway's Apprenticeship Department is happy to help.

QUESTIONS?

PLEASE CONTACT:

Gateway Technical College  
Apprenticeship Department  
262-564-2954

[apprenticeship@gtc.edu](mailto:apprenticeship@gtc.edu)

Notes associated with courses (identified by a superscript number at the end of the course title) are located on the front of the sheet.  
(\* ) indicates students must achieve a minimum of 2.0 ("C") or above for these major courses to meet graduation requirements.