

Program Number 31-601-2 Technical Diploma • Two Terms

ABOUT THE PROGRAM

The HVAC Installation Technician Diploma is a great first step for an entry-level position in the Heating, Ventilation, Air Conditioning, and Refrigeration (HVACR) fields. This training prepares individuals to install residential and light commercial HVACR systems used for the environmental control of buildings and product processes. It also provides instruction in construction trades fundamentals.

PROGRAM OUTCOMES

- Install HVAC components.
- Troubleshoot HVACR systems.
- Service HVAC systems.
- Evaluate HVACR system designs.

CAREER AND EDUCATION ADVANCEMENT OPPORTUNITIES

Lakeshore credits transfer to over 30 universities. For more information visit lakeshore.edu/future-students/transfer.

ADMISSIONS AND FIRST SEMESTER ENROLLMENT STEPS

- Submit online application.
- Complete the online Student Success Questionnaire.
- Complete Get Started at Lakeshore appointment:
 - Application Check-in
 - College Orientation Overview
 - 1st Time Program Registration

**Submit high school transcripts, college transcripts, and test scores (optional, highly recommended). Official transcripts will be needed for transferring college credit(s) and for financial aid purposes.*

ACADEMIC PREPAREDNESS/FUTURE SEMESTER ENROLLMENT STEPS

If applicable, complete program-specific academic preparedness requirements and enrollment steps prior to enrolling in occupational or core courses. Students will be notified if there is a program waitlist. View the college's program webpage for details: <https://lakeshore.edu/programs-and-courses/career-areas/architecture-construction/hvac>.

APPROXIMATE COSTS

\$152.85 per credit tuition (WI resident) plus \$9.17 per credit student activity fee. Material fee varies depending on course. Other fees vary by program. Visit lakeshore.edu/Financial-Aid/tuition-and-fees for details.

FINANCIAL AID

This program is eligible for financial aid. Visit lakeshore.edu/Financial-Aid for more information.

SPECIAL NOTE

Learn when you want. Progress at your own pace. Receive personalized coaching and support. The full CBE definition may be found at lakeshore.edu/cbe.

CONTACT

Lakeshore College Recruiter
920.693.1366 • Recruitment@lakeshore.edu

| Catalog No. | Class Title | Credit(s) |
|---------------|---|-----------------|
| Term 1 | | |
| 10601201 | HVAC Foundations* | 1 |
| 10601202 | HVAC Duct Systems* | 1 |
| 10601218 | HVAC Piping Applications* | 2 |
| 31420325 | Manufacturing Math* | 1 |
| 10442100 | Safety and Welding Fundamentals* | 1 |
| 10449114 | Safety in the Workplace* | 3 |
| 10601204 | HVAC Electrical - Theory* | 1 |
| 10601219 | HVAC Electrical - Applications* | 2 |
| 10601206 | HVAC Heating Systems and Sizing* | 1 |
| 10601216 | HVAC Residential Furnace Installation* | 2 |
| 10601208 | HVAC Residential Furnace Startup* | 1 |
| | | 16 |
| Term 2 | | |
| 10601210 | HVAC Air Conditioning - Theory* | 1 |
| 10601220 | HVAC Air Conditioning - Installation* | 2 |
| 10601212 | HVAC Air Conditioning - Startup* | 1 |
| 10601221 | HVAC Airflow - Principles* | 3 |
| 10601213 | HVAC Hydronic Heating Systems - Theory* | 1 |
| 10601217 | HVAC Hydronic Heating Systems - Installation* | 2 |
| 10601215 | HVAC Mini Split Systems* | 1 |
| 10601222 | HVACR Light Commercial Rooftop Units* | 2 |
| 10601223 | HVACR Refrigeration Applications* | 3 |
| | | 16 |
| | | TOTAL 32 |

* CBE delivery only

Curriculum and program acceptance requirements are subject to change. Program start dates vary; check with your academic counselor for details. The tuition and fees are approximate based on 2025-2026 rates and are subject to change prior to the start of the academic year.

HVAC AIR CONDITIONING - INSTALLATION...allows the learner to apply their knowledge and air conditioning theory in a laboratory setting on actual air conditioning systems. Students will gain hands-on experience identifying and operating various air conditioning and various related appliance systems. COREQUISITE: 10601210 HVAC Air Conditioning – Theory

HVAC AIR CONDITIONING - STARTUP...permits the learner to commission a residential air conditioning system and apply their previous knowledge and skill to troubleshoot common cooling system faults as well as replace frequently damaged components. COREQUISITE: 10601220 HVAC Air Conditioning – Installation

HVAC AIR CONDITIONING - THEORY...explains the fundamental operating concepts of the refrigeration cycle. Common systems, components, and refrigerants will be discussed and the association between temperature and pressure of cooling systems will be explored.

HVAC AIRFLOW - PRINCIPLES...instructs the learner in evaluating and testing natural gas and propane heating appliances. Major components and controls are identified, and the proper methods of troubleshooting and diagnosing are learned and practiced. Evaluating proper airflow patterns, combustion safety, and system performance for systems are emphasized. The main objective is to assist the technician to work on a variety of gas-fired appliances when the course is completed.

HVAC DUCT SYSTEMS...introduces the learner to sheet metal layout and duct fabrication. Students will gain experience in the sheet metal fabrication lab and hone their skills in sheet metal HVAC fabrication. Alternative ducting materials such as fiberglass and fabric ducting will also be discussed.

HVAC ELECTRICAL - APPLICATIONS...allows learners to apply the concepts learned in their Electrical Theory class. Learners will use multimeters to gain basic parameters and troubleshoot various HVAC electrical components. COREQUISITE: 10601204 HVAC Electrical – Theory

HVAC ELECTRICAL - THEORY...presents to the learner the basic electrical theory of Alternating and Direct Current. Students will study transformers, motors, and other HVAC specific electrical components.

HVAC FOUNDATIONS...provides students with the foundations of HVAC. Students will learn about the HVAC industry, the fundamentals of HVAC installation and service techniques, basic tools and, as well as trade mathematics. Professional licensure, certification, and various HVAC career paths will also be discussed.

HVAC HEATING SYSTEMS AND SIZING...focuses on the types of heating systems, forms of heat transfer and how they relate to the various HVAC heating systems in compliance with manual J. The basic operations of gas, oil, electric, and hydronic heating systems will be presented.

HVAC HYDRONIC HEATING SYSTEMS - THEORY...introduces the learner to hydronic heating systems, where fluid (usually water) is used to transfer heat. The various heating sources (gas oil, or electricity) for heating the water boiler will be presented and discussed.

HVAC HYDRONIC HEATING SYSTEMS-INSTALLATION...continues the student's hydronic heating education to include practical application with in-floor heating systems, radiators, boilers, and other common hydronic systems and components. COREQUISITE: 10601213 HVAC Hydronic Heating Systems – Theory

HVAC MINI SPLIT SYSTEMS...introduces students to the various components that make up these systems and will be able to install, troubleshoot, and service this equipment per manufacturer's instructions.

HVAC PIPING APPLICATIONS...presents to learners the copper, PVC, flexible, and black iron piping practices. Students will learn the skills to measure, cut, form, and connect various HVAC piping materials. This course will include extensive practice with threading, press fitting, brazing, and gluing practices for piping applications.

HVAC RESIDENTIAL FURNACE INSTALLATION...allows hands-on application of the knowledge learned in the heating systems theory class. Students will be identifying the various heating system components and differentiating the various heating systems. COREQUISITES: 10601206 HVAC Heating Systems and Sizing, 10601202 HVAC Duct Systems, and 10601218 HVAC Piping Applications

HVAC RESIDENTIAL FURNACE STARTUP...permits the learner to commission various heating systems and apply their previous knowledge and skill to troubleshoot common heating system faults as well as replace frequently damaged components. COREQUISITES: 10601219 HVAC Electrical Applications and 10601216 HVAC Residential Furnace Installation

HVACR LIGHT COMMERCIAL ROOFTOP UNITS...reviews components of light commercial rooftop (5 ton and smaller) units with and without economizers. Learners will troubleshoot system components, identify programs, and implement corrective actions. COREQUISITE: 10601208 HVAC Residential Furnace Startup

HVACR REFRIGERATION APPLICATIONS...provides instruction in refrigeration system piping, load calculation, sizing, and component selection. Training also covers service, troubleshooting, and the repair of commercial refrigeration systems including walk-in coolers/freezers, reach-in coolers/freezers, and ice machines. COREQUISITE: 10601212 HVAC Air Conditioning – Startup

MANUFACTURING MATH...prepares the learner to use scientific calculators for the applications of common fraction and mixed number problems, decimal problems, inch and metric conversion problems, basic percentage problems, powers and roots, and pre-algebra problems.

SAFETY AND WELDING FUNDAMENTALS...introduces the learner to the world of welding, weld shop safety practices, welding terminology, and welding machine setup to industry standards. Learners will be introduced to the three major welding processes: SMAW, GMAW, and GTAW and will build skills welding with each process in the flat and horizontal positions while using the common welding joints found in industry. The learner will process material using the two major handheld cutting processes - Oxyfuel and PAC.

SAFETY IN THE WORKPLACE...applies the skills and tools necessary to provide a safe and secure work environment. Each learner will demonstrate the application of safety awareness, federal/state/local compliance, incident investigation and documentation, human relations techniques, safety orientation, inspections, and risk analysis, issues of workplace violence, substance abuse, and health hazards, first aid and CPR, fire and electrical safety, emergency preparedness, and liaison with external agencies.