

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

ABOUT THE PROGRAM

The HVAC & Building Trades Fundamentals 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 HVACR (heating, ventilating, air conditioning, refrigeration) systems.
- Troubleshoot HVACR (heating, ventilating, air conditioning, refrigeration) systems.
- Perform HVACR (heating, ventilating, air conditioning, refrigeration) performance tests.

CAREER AND EDUCATION ADVANCEMENT OPPORTUNITIES

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

ADMISSIONS AND FIRST SEMESTER ENROLLMENT STEPS

- Submit online application.
- Complete the online Student Success Questionnaire.
- Complete Student Success Tutorial prior to meeting with your program counselor.
- Schedule your 1st Time Program Counseling/Registration Session with your assigned program counselor to plan your first semester schedule, review your entire plan of study and discuss the results of the Student Success Questionnaire.

**Submit transcripts and test scores (optional, highly recommended): College transcripts, along with high school transcripts and test scores from within the last five years, used for course registration. Official transcripts needed for transferring college credit(s) and for financial aid purposes.*

APPROXIMATE COSTS

\$149.50 per credit tuition (WI resident) plus \$8.97 per credit student activity fee. Material fee varies depending on course. Other fees vary by program. Visit gotoltc.edu/financial-aid/tuition-and-fees for details.

FINANCIAL AID

This program is eligible for financial aid. Visit gotoltc.edu/Financial-Aid or talk with your Admissions Advisor about how to apply for aid.

SPECIAL NOTE

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

CONTACT

Lakeshore Admissions Advisor
920.693.1366 • Admissions@gotoltc.edu

Catalog No.	Class Title	Credit(s)
Term 1		
10410101	Intro to Construction	2
10413105	Basic Electricity for Construction Trades	2
10410102	Blueprint Reading for Building Construction	2
10804107	College Mathematics	3
10442100	Safety and Welding Fundamentals	1
10601110	Mechanical Service Applications	3
13		
Term 2		
10601201	HVAC Foundations	1
10601202	HVAC Duct Systems	1
10601203	HVAC Piping Applications	1
10601204	HVAC Electrical - Theory	1
10601205	HVAC Electrical - Applications	1
10601206	HVAC Heating Systems & Sizing	1
10601207	HVAC Residential Furnace Installation	1
10601208	HVAC Residential Furnace Startup	1
10601209	HVAC Airflow Principles	1
10601210	HVAC Air Conditioning - Theory	1
10601211	HVAC Air Conditioning - Installation	1
10601212	HVAC Air Conditioning - Startup	1
10601213	HVAC Hydronic Heating Systems - Theory	1
10601214	HVAC Hydronic Heating Systems - Installation	1
10601215	HVAC Mini-Split Systems	1
		15
		TOTAL 28

Curriculum and program acceptance requirements are subject to change. Program start dates vary; check with your program counselor for details. The tuition and fees are approximate based on 2024-2025 rates and are subject to change prior to the start of the academic year.

BASIC ELECTRICITY FOR CONSTRUCTION TRADES...provides practical DC/AC concepts to introduce various components, electrical quantities, and measuring values in DC and AC circuits. Circuit measurement of voltage, current, and resistance will be taken with analog and digital meters applying basic concepts. The student will learn about electrical theory, electrical safety, basic circuit design, measuring equipment, general wiring practices, motors, and transformers.

BLUEPRINT READING FOR BUILDING CONSTRUCTION...provides instruction in reading and interpreting shop drawings, residential drawings, and commercial building plans. Emphasis is placed on building terminology and learning conventional techniques of communicating building methods from the designer to the builder. Students learn to visualize the structure and to interpret elevations, plan views, details, and sections from drawings. They also learn to read and interpret building specifications.

COLLEGE MATHEMATICS...is designed to review and develop fundamental concepts of mathematics pertinent to the areas of: 1) arithmetic and algebra; 2) geometry and trigonometry; and 3) probability and statistics. Special emphasis is placed on problem solving, critical thinking and logical reasoning, making connections, and using calculators. COREQUISITE: Math placement assessment or equivalent

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 or PREREQUISITE: 10601113 HVAC Air Conditioning-Applications

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: 10601211 HVAC Air Conditioning-Installation or PREREQUISITE: 10601114 HVAC Air Conditioning-Startup/Troubleshoot

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 or PREREQUISITE:10601104 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. COREQUISITES: 10601202 HVAC Duct Systems and 10601203 HVAC Piping Applications or PREREQUISITES: 10601102 HVAC Duct Systems and 10601103 HVAC Piping-Applications

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 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 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. COREQUISITE: 10601206 HVAC Heating Systemsand Sizing or PREREQUISITE: 10601107 HVAC Heating Systems-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. COREQUISITE: 10601207 HVAC Residential Furnace Installation or PREREQUISITE: 10601108 HVAC Heating Systems-Startup/Troubleshoot

INTRODUCTION TO CONSTRUCTION...provides the learner with an overview of the various construction trades including framing, roofing, masonry block work, masonry flat work, electrical, HVAC, plumbing, and finish cabinetry work.

MECHANICAL SERVICE APPLICATIONS...students will learn and apply skills related to mechanical applications regarding hand and power tools, brazing, black pipe, PVC, Pex, electrical conduit, and basic sheet metal for flashing and ducts.

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 hand-held cutting processes - Oxyfuel and PAC.