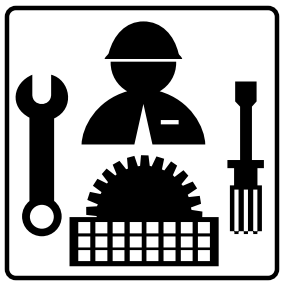

heating, ventilation, and air conditioning (hvac) installer

Technical Diploma
Program Code: 30-401-4
Total Credits: 25

Mid-State's Heating, Ventilation, and Air Conditioning (HVAC) Installer program provides the hands-on foundation needed for an entry-level position in the heating, ventilation, air conditioning (HVAC) fields. Graduates will understand the various components of heating, ventilation, air-conditioning, and refrigeration systems, including furnaces, ductwork, boilers, hydronic piping, HRVs (heat recovery ventilators), evaporators, condensers, circuits, and controls. Students will also explore geothermal, biomass, and solar heating systems. Through hands-on classroom lab activities, students will join various piping types, design and construct ductwork, and install a complete residential HVAC system. They will also learn the electrical skills necessary to read wiring diagrams and troubleshoot mechanical control systems. Graduates are prepared to take the EPA 608 Technician Certification exam for refrigerants.

Estimated tuition and fees: mstc.edu/programcosts

ACADEMIC ADVISOR
To schedule an appointment with an academic advisor, call 715.422.5300. Academic advisors will travel to other campuses as necessary to accommodate student needs. For more information about advising, visit **mstc.edu/advising**.

CHECKLIST:
This section will be completed when meeting with your academic advisor.

- ❑ FAFSA (www.fafsa.gov)
- ❑ Financial Aid Form(s)
  Form(s): _____
- ❑ Follow-Up Appointment:
  Where: _____
  When: _____
  With: _____
- ❑ Official Transcripts
  Mid-State Technical College
  Student Services Assistant
  1001 Centerpoint Drive
  Stevens Point, WI 54481
- ❑ Other: _____
  _____

mstc.edu
888.575.6782
TTY: 711

MID-STATE TECHNICAL COLLEGE

ADAMS CAMPUS
401 North Main
Adams, WI 53910

MARSHFIELD CAMPUS
2600 West 5th Street
Marshfield, WI 54449

STEVENS POINT CAMPUS
1001 Centerpoint Drive
Stevens Point, WI 54481

WISCONSIN RAPIDS CAMPUS
500 32nd Street North
Wisconsin Rapids, WI 54494

career pathway

BACHELOR'S DEGREE OPTIONS

Bellevue University
Colorado State University Global
Concordia University
Franklin University
Grand Canyon University (GCU)
Lakeland University
Milwaukee School of Engineering (MSOE)
Mount Mary University (MMU)
University of Phoenix
UW-Green Bay
UW-Marshfield of Wood County
UW-River Falls
UW-Stevens Point
UW-Stout
Wisconsin Private, Non-profit Universities/Colleges

For more information and additional opportunities, visit mstc.edu/transfer.

EARN A BACHELOR'S DEGREE

START YOUR CAREER

RENEWABLE ENERGY TECHNICIAN

ASSOCIATE IN APPLIED SCIENCE

ONLY 36 MORE CREDITS

CAREER OPTIONS

Energy Load Estimator
Renewable Energy Technical Sales Representative
Solar Installer

START YOUR CAREER

HEATING, VENTILATION, AND AIR CONDITIONING INSTALLER

TECHNICAL DIPLOMA

ONLY 14 MORE CREDITS

CAREER OPTIONS

Building Controls Technician
Heating, Ventilation, and Air Conditioning Installer
Heating and Air Conditioning Mechanic

START YOUR CAREER

CONSTRUCTION TRADES

TECHNICAL DIPLOMA

11 CREDITS

CAREER OPTIONS

Electrical Contracting Laborer
Carpentry Contracting Laborer
Plumbing Contracting Laborer

OTHER OPTIONS

APPRENTICESHIP OPPORTUNITIES

- Carpenter Apprenticeship
- Construction Electrician (ABC) Apprenticeship
- Construction Electrician (IBEW-NECA) Apprenticeship
- Plumber Apprenticeship
- Steamfitter and Steamfitter Service Apprenticeship

HIGH SCHOOL STUDENT

COLLEGE TRANSFER

RETURNING ADULT

College Credit • Dual Credit • Military Experience • Work Experience
Learn about Credit for Prior Learning at mstc.edu/cpl.

BEGIN AT ANY POINT IN THE PATHWAY

PROGRAM OUTCOMES

Employers will expect you, as a Heating, Ventilation, and Air Conditioning (HVAC) Installer graduate, to be able to:

- Join pipes or tubing to equipment and to fuel, water, or refrigerant source to form complete circuit.
- Test pipe or tubing joints or connections for leaks, using pressure gauge or soap-and-water solution.
- Lay out and connect electrical wiring between controls and equipment, according to wiring diagrams, using electrician's hand tools.
- Install, connect, and adjust thermostats, humidistats, and timers using hand tools.
- Test electrical circuits or components for continuity using electrical test equipment.
- Repair or replace defective equipment, components, or wiring.
- Obtain and maintain required certifications.
- Install ductwork and test for leaks.
- Size and lay out ductwork.
- Comply with all applicable standards, policies, and procedures, including safety procedures and the maintenance of a clean work area.
- Inspect and test systems to verify system compliance with plans and specifications or to detect and locate malfunctions.

TECHNICAL SKILLS ATTAINMENT

The Wisconsin Technical College System (WTCS) has implemented a requirement that all technical colleges measure program outcomes attained by students. This requirement is called Technical Skills Attainment (TSA). The main objective of TSA is to ensure graduates have the technical skills needed by employers. Students are notified of TSA reporting in their final few courses of the program.

STUDENT HANDBOOK

Visit **mstc.edu/studenthandbook** to view Mid-State's student handbook, which contains information about admissions, enrollment, appeals processes, services for people with disabilities, financial aid, graduation, privacy, Mid-State's Student Code of Conduct, and technology.

GRADUATION REQUIREMENT

The GPS for Student Success course is required for all Mid-State program students and is recommended to be completed before obtaining 12 credits. (Not counted in the total credit value for this program.) Some students are exempt from this requirement. Please see your program advisor for more information.

GPS for Student Success
10890102 .....1 credit
Integrate necessary skills for student success by developing an academic plan, identifying interpersonal attributes for success, adopting efficient and effective learning strategies, and utilizing Mid-State resources, policies, and processes. This course must be completed prior to obtaining 12 credits and is a graduation requirement.

ADDITIONAL COURSES AS NEEDED

The following courses may be recommended or required if the student does not achieve minimum Accuplacer scores.

Intro to College Reading
10838104 .....2 credits
Provides learners with the opportunities to develop and expand reading skills, including comprehension and vocabulary skills. Learners apply reading skills to academic tasks and read to acquire information from a variety of sources.

Intro to College Writing
10831103 .....3 credits
Introduces basic principles of composition, including organization, development, unity, and coherence in paragraphs and multi-paragraph documents. The purpose of this course is to prepare students for successful entry into required program courses. This course is tuition bearing and under certain circumstances may qualify for financial aid. This course cannot be used to satisfy program completion requirements at Mid-State.
Prerequisite: Accuplacer Sentence Skills score of 60 or equivalent. Proficiency in word processing skills recommended.

Pre-Algebra
10834109 .....3 credits
Provides an introduction to algebra. Includes operations on real numbers, solving linear equations, percent and proportion, and an introduction to polynomials and statistics. Prepares students for elementary algebra and subsequent algebra-related courses.
Prerequisite: Accuplacer Math score of 65, Accuplacer Algebra score of 30, ABE Math Prep V 76854785 and ABE Math Prep VI 76854786 with a grade of "S." (Note: ABE Math Prep V and VI courses cannot be used to satisfy program completion requirements at Mid-State.)

SAMPLE FULL-TIME CURRICULUM OPTION

Term		13 credits
10442117	Welding Fundamentals 1	1
10476171	Safety for Construction Trades	1
10482107	Construction Fundamentals	2
10483121	Piping Applications	3
10601110	HVAC Heating Fundamentals	2
10601130	Blueprint Reading for Construction Trades	2
10601140	Electricity for the Construction Trades	2
Term		**12 credits**
10483102	Electrical Components & Control Circuits	2
10483110	Sustainable Heating System Design & Installation	3
10483115	Energy Load Estimation and Modeling	3
10601120	HVAC Air Conditioning Fundamentals	2
10601121	Intro to HVAC Installation	2
		Total credits 25

Please Note:
- This curriculum sequence is only for student planning. Actual student schedules will vary depending on course availability.
- Program completion time may vary based on student scheduling and course availability. For details, go to **mstc.edu/classfinder**.

SAMPLE PART-TIME CURRICULUM OPTION

Term		8 credits
10442117	Welding Fundamentals 1	1
10483121	Piping Applications	3
10601110	HVAC Heating Fundamentals	2
10601140	Electricity for the Construction Trades	2
Term		**5 credits**
10476171	Safety for Construction Trades	1
10482107	Construction Fundamentals	2
10601120	HVAC Air Conditioning Fundamentals	2
Term		**5 credits**
10483115	Energy Load Estimation and Modeling	3
10601130	Blueprint Reading for Construction Trades	2
Term		**7 credits**
10483102	Electrical Components & Control Circuits	2
10483110	Sustainable Heating System Design & Installation	3
10601121	Intro to HVAC Installation	2
		Total credits 25

NOTES:

Blueprint Reading for Construction Trades
10601130.....2 credits
Develops the ability to read blueprints for commercial and non-commercial structures. Emphasizes blueprints drawn by licensed architects, covering plumbing, electrical wiring, structural framing, millwork, interior and exterior details, and basic information.

Construction Fundamentals
10482107.....2 credits
Studies the concepts associated with the theory, materials, and methods used in construction, including footings and foundations, walls, floors, roofs and roof materials, exterior finishes, interior walls, ceiling and floor finishes, insulation types, vapor and air infiltration, and sound protection. Students also become familiar with blueprint reading and examine all trades associated with construction, including, electrical, HVAC, and plumbing. Safe use of the appropriate tools for each trade is covered.

Electrical Components & Control Circuits
10482103.....2 credits
Topics include a review of AC/DC electricity fundamentals and the physical laws that apply to electronic circuits. Direct current (DC) covers basic definitions of voltage, current, and resistance and analysis of series and parallel resistive circuits. Alternating current (AC) includes an introduction to AC generation, capacitors, inductors, and transformers and their applications in electronic circuits. Additional topics include control circuits, symbols, diagrams, protection devices, relays, thermostats, single-phase motors, control components, and troubleshooting ACR system wiring diagrams.
Prerequisite: Electrical Circuits I 10605105 or Intro to Electronics 10605108 or Electricity for the Construction Trades 10601140

Electricity for the Construction Trades
10601140.....2 credits
This course is an introduction to electrical theory and application for those in the construction and building trades. Content includes AC and DC circuits, schematics, Ohms law, multimeter use and circuit troubleshooting. This course will also provide an introduction to the contents of the National Electric Code (NEC).

Energy Load Estimation and Modeling
10483115.....3 credits
In this course students will develop the skills to do residential and light commercial energy load estimations. Students will calculate heating and cooling building loads and estimate energy consumption rates and quantities. The student will also estimate energy upgrades such as insulation, window improvements, etc. and calculating payback and fuel savings. The course covers a variety of computer programs available for analyzing buildings.

HVAC Air Conditioning Fundamentals
10601120.....2 credits
Topics include air conditioning principles and terms, physical principles of air movement, air filtering and humidity, and methods of conditioning air for comfort and health. Also covers the proper use of psychrometers, dry bulb thermometers, hygrometers, and reading and interpretation of psychrometric charts and scales as well as ASHRAE and BPI ventilation standards for residential units. (HVAC is a common industry reference to heating, ventilation, and air conditioning.)

HVAC Heating Fundamentals
10601110.....2 credits
Provides an introduction to how homes and buildings are heated. Topics include introduction to heat principles, temperature measurement, fuels and other sources of heat, combustion, basic heating systems, basic furnace design, boiler design and operation, venting of furnaces, chimney or exhaust gases, and system controls. (HVAC is a common industry reference to heating, ventilation, and air conditioning.)

Intro to HVAC Installation
10601121.....2 credits
Addresses residential and light commercial heating and cooling systems. Emphasizes the diversity of heating and cooling systems and how they operate. Students participate in the installation of a variety of HVAC systems and troubleshoot and service systems. (HVAC is a common industry reference to heating, ventilation, and air conditioning.)

Piping Applications
10483121.....3 credits
Presents the fundamentals of plumbing and piping installation practices. Laboratory activities provide students with basic pipe joining processes associated with the plumbing and HVAC industries.

Safety for Construction Trades
10476171.....1 credit
The Safety for the Construction Trades course teaches construction related workers about their rights, employer responsibilities and how to identify, abate, avoid and prevent job related hazards. Students will familiarize themselves with the proper selection and use of personal protective equipment and safety requirements on a construction site for various activities. Course outcomes align with the training outcomes recommended by OSHA. Upon successful completion, students will receive an OSHA 10 Card.

Sustainable Heating System Design & Installation
10483110.....3 credits
Addresses solar thermal, geothermal, and biomass heating systems. Students participate in the installation and design of a solar hot water system. Topics include safety; system design and layout; component selection; mounting collectors; installing and insulating copper tubing; and installing a storage tank, heat exchanger, circulation pump, and other system components.

Welding Fundamentals 1
10442117.....1 credit
An introduction to fundamental welding techniques with an emphasis on safe work habits that covers the processes of FCAW, GMAW, and OXY-Fuel cutting. Classroom instruction pared with lab activities are designed to provide fundamental skills in each of the welding processes covered in the class.