# HEATING, VENTILATION, AIR CONDITIONING, AND REFRIGERATION (ITC)

## *Intermediate Technical Certificate*

**Career-Technical Program**
**Interest Areas:**
**Manufacturing and Trades**

This nine-month certificate program in Heating, Ventilation, Air Conditioning, and Refrigeration prepares students for entry-level positions in this challenging occupation. Entry-level HVACR technicians typically work on residential and light commercial HVACR systems performing equipment installations, preventative maintenance and service, and repair tasks. Additional opportunities are also available in system design and sales occupations.

Students will study basic HVACR systems, electricity, heating systems, local fuel codes, applied thermodynamics, refrigeration cycle, psychometrics, duct system design, and system diagnosis. These skills are taught in classroom theory and learned in hands-on lab exercises and cooperative work experiences. A general education component consisting of communication, occupational relations, and math is integrated into the program. Successful completion of the first semester or permission of the instructor is required to continue into the second semester. Placement in specific English and math courses is determined by the college assessment test.

Successful completion of this program satisfies the four-year related training requirement for the Idaho State HVAC apprenticeship program.

**Current industry professionals may enroll in a single course on a space available basis and with the instructor's permission.**

Gainful Employment Information (https://www.nic.edu/programs/ge/35-CC1/Gedt.html)

Program Website (https://www.nic.edu/programs/viewprogram.aspx?program_id=35)

## Program Requirements

| Course | Title | Credits |
|---|---|---|
| **Semester 1** | | |
| HVAC-161 | HVACR Principles | 3 |
| HVAC-161L | HVACR Lab I | 5 |
| HVAC-165 | HVACR Electrical | 4 |
| HVAC-167 | HVACR Heating | 4 |
| Select one of the following: | | 2-3 |
| CAOT-162 | Introduction to Computer Applications | |
| CAOT-164 & CAOT-165 & CAOT-166 | Computer Fundamentals for Technical Programs and Productivity Software for Technical Programs and Living Online for Technical Program | |
| Select one of the following: | | 3-5 |
| MCTE-106 | Technical Mathematics for Industrial Mechanic/ Millwright; HVAC; Welding | |
| GEM 3 - A.A.S. Mathematical Ways of Knowing | | |
| | Credits | 21-24 |
| **Semester 2** | | |
| ATEC-117 | Occupational Relations and Job Search | 2 |
| HVAC-171L | HVACR Lab II | 5 |
| HVAC-175 | HVACR Systems | 4 |
| HVAC-177 | Refrigeration | 4 |
| HVAC-180 | HVACR Codes and Licenses | 3 |
| ECTE-100 or ENGL-101 | Fundamentals for Writing or English Composition | 3 |
| | Credits | 21 |
| | Total Credits | 42-45 |

### Course Key

GEM | WCHE | AAS Institutionally Designated | Gateway | Milestone

## Program Outcomes

Upon completion of the program, students will be able to:

- Recognize and apply proper safety techniques and procedures for troubleshooting and servicing HVAC/R systems.
- Describe the sequence of operation and properly install and repair fossil fuel combustion systems found in residential and light commercial applications.
- Describe the sequence of operation and properly install and repair oil combustion and electric furnace operations.
- Demonstrate proficiency in safe refrigerant handling and recovery.
- Troubleshoot and apply service knowledge to various refrigeration processes, including heat pumps, walk-in coolers and chillers.
- Exhibit HVAC/R work and safety industry competencies by modeling teamwork, and clean and safe shop practices.
- Demonstrate good work habits, communication practices and computation skills used in the HVAC/R industry.
- Read and interpret electrical schematics and building blue prints.
- Obtain a Universal Refrigerant Handling Card allowing work on any size refrigeration system.
- Obtain a Heating Mechanic 1 license allowing work on heating equipment less than 400,000 BTU’s/HR.
- Obtain class extra credit for obtaining a Low Pressure Boiler Operator License.
- Receive 1000 hour credit toward obtaining a 06A Electrician License for HVAC/R industry work and 2000 hour credit towards the Idaho HVAC/R Journeyman License.