HEATING, AIR CONDITIONING, AND REFRIGERATION

The Heating, Air Conditioning, and Refrigeration (HACR) program prepares students for entry-level positions in the HACR industry. Every new home, hospital, institutional building, shopping mall, and office complex requires trained and certified technicians to install and maintain HACR systems. New Mexico’s climate creates an additional demand for technicians skilled in both heating and cooling technology. Among the program offerings is an EPA certification short course needed by all persons who work with refrigerants.

Graduation Requirements

Certificate in Heating, Air Conditioning, and Refrigeration: WorkKeys® scores of level 4 in Reading for Information, level 5 in Locating Information, and level 5 in Applied Mathematics; cumulative GPA of 2.0 or higher; the last 15 credits taken at NMSU.

AAS in Heating, Air Conditioning, and Refrigeration: ENGL 111G Rhetoric and Composition with a C or higher; placement into college-level math and reading courses or completion of developmental courses with a C or higher; cumulative GPA of 2.0 or higher; the last 15 credits taken at NMSU.


Gainful Employment Disclosure: Important information about the educational debt, earnings, and completion rates of students who attend this program can be found on the following Gainful Employment Disclosure (https://carlsbad.nmsu.edu/about-us/gainful-employment)


HVAC 100. EPA Clean Air Act: Section 608
1 Credit
Refrigerant certification preparation to include basics of refrigerant bearing equipment, ozone depletion and the new legislation, technician categories covered and the certification examination.

HVAC 101. Fundamentals of Refrigeration
4 Credits (3+2P)
Refrigeration cycle and the various mechanical components. Use of special tools, equipment, and safety precautions.

HVAC 102. Fundamentals of Electricity
4 Credits (3+2P)
Introduction to electricity theory, OHM’s Law, circuits, AC/DC, and practical applications.

HVAC 103. Electrical and Mechanical Controls I
4 Credits (3+2P)
Applications of basic electrical and mechanical controls. Reading and drawing diagrams of simple refrigerating equipment. Safe use of testing equipment.
Prerequisites: HVAC 101 and HVAC 102, or consent of instructor.

HVAC 104. Electrical and Mechanical Controls II
4 Credits (3+2P)
Applications of electrical and mechanical controls (Refrigeration, heating, and cooling). Reading and interpreting diagrams.
Prerequisites: HVAC 102 and consent of instructor.

HVAC 111. Job Shadowing
1 Credit
Course will expose students to actual HVAC/R field work and provide them knowledge of the expectations of field work as they shadow an HVAC/R technician. Consent of instructor required. Restricted to: Community colleges only.

HVAC 112. Residential Cooling
1 Credit
Course will expose students to actual HVAC/R field work and provide them knowledge of the expectations of field work as they shadow an HVAC/R technician. Consent of instructor required. Restricted to: Community colleges only.

HVAC 113. Job Shadowing
1 Credit
Course will expose students to actual HVAC/R field work and provide them knowledge of the expectations of field work as they shadow an HVAC/R technician. Consent of instructor required. Restricted to: Community colleges only.

HVAC 205. Commercial Refrigeration Systems
4 Credits (3+2P)
Service and maintenance of commercial refrigeration equipment to include evacuation and charging procedures, electrical diagrams, and compressors and accessories.
Prerequisites: HVAC 103 or consent of instructor.

HVAC 206. Residential Air Conditioning Systems
4 Credits (3+2P)
Applications and types of equipment used in comfort cooling. Preventive maintenance, service, and repairs common to evaporative coolers and refrigerated air conditioning systems. Air properties and psychometrics.
Prerequisite: HVAC 103 or consent of instructor.

HVAC 207. Residential Heating Systems
4 Credits (3+2P)
Gas and electric systems used in comfort heating. Maintenance procedures, safety, troubleshooting, and servicing malfunctions in equipment.
Prerequisite: HVAC 103 or consent of instructor.

HVAC 208. Residential Heating Systems
4 Credits (3+2P)
Gas and electric systems used in comfort heating. Maintenance procedures, safety, troubleshooting, and servicing malfunctions in equipment.
Prerequisite: HVAC 103 or consent of instructor.

HVAC 209. Commercial Refrigeration Systems
4 Credits (3+2P)
Service and maintenance of commercial refrigeration equipment to include evacuation and charging procedures, electrical diagrams, and compressors and accessories.
Prerequisites: HVAC 103 or consent of instructor.

HVAC 210. Commercial Heating and Cooling Systems
4 Credits (3+3P)
Covers troubleshooting mechanical and electrical problems associated with HVAC equipment in commercial buildings. Includes gas, electric, and heat pump systems. Restricted to Community Colleges campuses only.
Prerequisite(s): HVAC 103 or consent of instructor.

HVAC 211. Heat Pump Systems
4 Credits (3+2P)
Reverse cycle refrigeration systems utilized in comfort heating and cooling. Troubleshooting mechanical electrical problems associated with heat pumps. HVAC 103 or consent of instructor.

HVAC 212. Practicum
3 Credits
Working in the field with journeymen service technicians. Develop and apply job skills. May be repeated up to 3 credits. Consent of Instructor required. Restricted to: HVAC majors. Restricted to Community Colleges campuses only.
Prerequisite(s): HVAC 113 and Consent of instructor.

HVAC 220. Introduction to Sheet Metal Fabrication
4 Credits (3+2P)
Introduction to sheet metal fabrication to include hands-on practical laboratory applications, cutting and forming procedures, identifying types and gauges. Design and layout techniques.
Prerequisite: OETS 118 or equivalent math or consent of instructor.
HVAC 225. New Mexico Mechanical Codes: HVAC
1-4 Credits
Principles and regulations developed for HVAC, sheet metal, and plumbing occupations to include terminology, ventilation air supply, exhaust systems, duct systems, combustion air, chimneys and vents, boilers/water heaters, refrigeration, panel and hydronic panel heating, fuel gas piping, storage systems, solar systems, and workmanship standards. May be repeated for a maximum of 12 credits.

HVAC 255. Special Topics
1-6 Credits
Topics to be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits.
Prerequisite: consent of instructor.

HVAC 290. Special Problems
1-4 Credits
Individual studies related to heating, air conditioning, and refrigeration.
Prerequisites: HVAC 101, HVAC 102, and consent of instructor.