HEATING, VENTILATION, AIR CONDITIONING AND REFRIGERATION

Associate of Applied Science Degree

Certificates of Completion

- HVAC/R

The climate in New Mexico creates a demand for skilled technicians in both heating and cooling because people prefer to live and work in comfort. Every new home, hospital, university building, shopping mall, or office complex requires installation mechanics, service technicians, operating engineers, maintenance foremen, and trained crews to keep complex environmental systems operating efficiently.

The heating, air conditioning, and refrigeration industry is one of the country's most stable. The supply of qualified, trained people has not kept pace with the demand, and new opportunities are constantly developing. The demand for trained HVAC/R graduates is also increasing due to Environmental Protection Agency requirements that refrigerants be handled by a certified technician.

Technicians knowledgeable in heating, air conditioning, and refrigeration are also needed in defense, space exploration, and manufacturing. Because climate control is important wherever microprocessors are used in manufacturing or scientific research, skilled technicians are in demand in these fields. Many experienced technicians own and manage their own businesses.

The Heating, Ventilation, Air Conditioning and Refrigeration program at DACC uses training facilities equipped with the most modern test equipment and tools available. As a student, you will learn to—

- service, repair, and maintain heating, air conditioning, and refrigeration systems;
- read and interpret technical drawings, schematics, and symbols to diagnose and troubleshoot problems in a system;
- evaluate, diagnose, and service various mechanical and electrical controls;
- apply the mathematics related to the heating, air conditioning, and refrigeration trade;
- handle customer relations, shop management procedures, and record keeping relative to the trade;
- properly use special tools and testing equipment; and
- become certified in Section 608, EPA Certification.

Students will complete a one-credit Job Shadowing course during their first semester that will allow the student the opportunity to see firsthand the daily activities of a HVAC technician. A unique practicum training program is offered during the final semester to provide students with field experiences. Working side by side with journeymen technicians, students are offered an opportunity to practice and refine their new skills.

After the first semester, full-time heating, air conditioning, and refrigeration students must purchase a personal set of technician's tools (approximate cost, which may vary, $1300). The tool set includes the basic tools that most employers require on the job. Part-time students will purchase only those tools required by the specific course(s) in which they are enrolled. Students must also purchase an iPad at the approximate cost of $400 that will be used to access course materials and document completion of course competencies.

Students will also provide their own medical/accident insurance. They need to be in good physical condition and possess the ability and desire to work with their minds and hands.

The curriculum is competency and performance based and uses multimedia classroom instruction and hands-on laboratory exercises. Classroom and laboratory hours are listed in the Schedule of Classes.

All heating, air conditioning, and refrigeration students are eligible to join SkillsUSA. Membership provides students an opportunity to develop their leadership skills and to become proficient in public speaking and parliamentary procedure. SkillsUSA also offers students a chance to demonstrate their occupational skills. Skill competitions are conducted each year in New Mexico for all post-secondary students.

Whether taking classes or working on a job site, students enrolled in this program will be required to perform the same job duties and be able to meet the same physical requirements that they will as a graduate in the field. Depending where they find employment, graduates may be required to

- work in inclement weather,
- lift up to 50 pounds from the ground,
- have good eye-hand coordination,
- work safely around electrical hazards using the appropriate safety equipment,
- work safely using hand and power tools,
- ascend and descend stairs and ladders, and
- stand, squat, stoop, or kneel for long periods of time.

Licensure for journeyman gas fitters, journeyman refrigeration workers, and journeyman sheet metal workers require both a written and practical exam. Not all licensing agencies provide special testing accommodations.

NOTE: Students must earn a final grade of C- or better in all required HVAC courses/Technical Requirements and achieve a cumulative grade-point average of at least 2.0. A grade of C- or better is required in ENGL 1110G Composition I and designated Mathematics courses.

Heating, Ventilation, Air Conditioning and Refrigeration - Associate of Applied Science (http://catalogs.nmsu.edu/dona-ana/academic-career-programs/hvac-refrigeration/heating-ventilation-air-conditioning-refrigeration-associate-applied-science/)

HVAC/R - Certificate of Completion (http://catalogs.nmsu.edu/dona-ana/academic-career-programs/hvac-refrigeration/hvacr-certificate-completion/)

Residential HVAC - Certificate of Completion (http://catalogs.nmsu.edu/dona-ana/academic-career-programs/hvac-refrigeration/residential-hvac-certificate-completion/)

HVAC 100. EPA Clean Air Act: Section 608
1 Credit (1)
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 110. Professional Development and Leadership
1 Credit (1)
As members and/or officers of various student professional organizations, students gain experience in leadership, team building, and community service. Students competing in Skills USA are required to register for the course. May be repeated up to 6 credits. Consent of Instructor required. Restricted to: HVAC majors. Graded: S/U Grading (S/U, Audit). Restricted to: Community Colleges only.

HVAC 113. Job Shadowing
1 Credit (1)
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 207. 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 209. 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 210. Commercial Air Conditioning and Heating 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 213. Practicum
3 Credits (3)
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.

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