

Heating, Vent., Air Conditioning (HVAC)

Courses

HVAC 105 HVAC Fundamentals (4 Hours)

This is a beginning course in heating, ventilation and air conditioning technology that is appropriate for HVAC students. Upon successful completion of this course, the student should be able to identify the basic components of an air-conditioning system. Topics will include heat laws, refrigerants, oils and refrigeration cycles. In the lab, students will design, assemble and operate a working refrigeration system. Competencies will include brazing, wiring, evacuating and charging a system. 3 hrs. lecture/wk. and 3 hrs. lab/wk.

HVAC 110 Electrical Fundamentals (4 Hours)

This course is in electrical theory and is required for HVAC but is appropriate for all interested students. Common electrical components found in the HVAC industry are used to develop these skills. Upon successful completion of this course, the student should be able to identify electrical components and their relationships to the various repair and troubleshooting techniques. 3 hrs. lecture/wk. and 3 hrs. lab/wk.

HVAC 125 Energy Alternatives (2 Hours)

Upon successful completion of this course, the student should be able to identify diverse methods of alternate energy production. Some of the technologies that will be discussed are wind energy, photoelectric energy, nuclear energy, hydroelectric energy, biomass and alternate fuel vehicles. Students will understand the advantages of using various alternate energy technologies, the effects or by-products of each and the problems that might be encountered. Some student research will be included in the context of the course. Emphasis will be on the most promising or effective alternate energy technologies available. 2 hrs. lecture/wk.

HVAC 136 Heating System Fundamentals (3 Hours)

Upon successful completion of this course, the student should be able to identify all the components and accessories in residential heating systems. Emphasis will be on the electrical diagrams and mechanical principles. Practical instruction in service diagnostic procedures for efficient operation, maintenance and troubleshooting of these systems make up the lab portion of the course. 2 hrs. lecture/wk. and 3 hrs. lab/wk.

HVAC 164 EPA 608 Refrigerant Management (1 Hour)

The student should have a complete understanding and knowledge of the characteristics of several different types of refrigerants and the correct usage. Upon completion of this course, the student should be able to pass the examination set forth by a third-party testing facility. 1 hr. lecture/wk.

HVAC 165 410-A Refrigerant Management (1 Hour)

Upon completion of this course, the students should be able to understand nuances of new refrigerants on the market. The student should have a complete understanding and knowledge of the characteristics of R-410-A. Upon completion of this course, the student should be able to pass the examination set forth by a third-party testing facility. 1 hr. lecture/wk.

HVAC 167 Sheet Metal Layout and Fabrication (3 Hours)

Upon successful completion of this course, the student should be able to identify the components, equipment and operation for sheet metal layout and fabrication. Practice problems are included at the end of each unit in order to provide the student with an opportunity to apply the methods attained by sheet metal layout. Shop facilities are available. The patterns will be fabricated and joined into a line of fittings. This gives the most complete test of pattern accuracy and also provides the experience needed by a competent layout person. The student will be required to provide ANSI Z87 safety glasses and may be expected to provide other basic hand tools and/or equipment. 2 hrs. lecture, 3 hrs. lab/wk.

HVAC 188 Load Calculation and Duct Design (3 Hours)

Upon successful completion of this course, students will be able to perform a load calculation for residential HVAC applications. The student should be able to determine proper sizing of residential HVAC equipment and duct work to meet the requirements for high-quality climate control system. The students will use the Air Conditioning Contractors of America (ACCA) Manual J and current industry recognized manufactures data to determine the correct size of the HVAC equipment used in a residential applications. 2 hrs. lecture/wk. and 3 hrs. lab/wk.

HVAC 201 Cooling Systems* (3 Hours)

Prerequisites: HVAC 105 and HVAC 110.

Upon successful completion of this course, the student should be able to identify all the components and accessories and their relationship to the functions of residential and commercial air conditioning and heat pump systems. Topics covered will include air conditioner condensing units, metering devices, evaporation coils and refrigerants. 2 hrs. lecture/wk. and 3 hrs. lab/wk.

HVAC 210 Plumbing Fundamentals* (3 Hours)

Prerequisites: HVAC 250.

This is an introductory course in plumbing technology that is appropriate for HVAC students. Upon successful completion of this course, the student should be able to identify and repair most of the basic components in a plumbing system. Topics will include soldering and brazing, plumbing repair, sizing of water distribution lines, including drain, waste and vent (DWV) piping, and supply water lines. Instruction includes examining the International Plumbing Code (IPC) and International Fuel Gas Code (IFGC). 2 hrs. lecture/wk. and 3 hrs. lab/wk.

HVAC 220 HVAC Trade Certification Review* (2 Hours)

Prerequisites: HVAC 188 and HVAC 250.

This course will prepare students to take one of the main HVAC industry standard certification North American Technician Excellence (NATE) test, which will consist of the core fundamentals of HVAC, gas heating, air conditioning and heat pumps. 2 hr. lecture/wk.

HVAC 231 HVAC Rooftop Units* (3 Hours)

Prerequisites: HVAC 105 and HVAC 110.

Topics will include electrical controls and economizers of various rooftop units, roof curbs, installation, service, diagnosis, evacuation and charging of typical light commercial rooftop units. The student will be required to provide ANSI Z87 safety glasses and may be expected to provide other basic hand tools and/or equipment. 2 hrs. lecture and 3 hrs. lab/wk.

HVAC 250 HVAC Installation and Start-up Procedures* (3 Hours)

Prerequisites or corequisites: HVAC 136 and HVAC 201.

Upon successful completion of this course, the student will be able to identify techniques and procedures to install new systems and retrofit systems. Topics include initial start-up, maintenance of furnaces and air conditioners, electrical requirements, permits and inspections, combustion air, sheet metal and applying mechanical standards. 2 hrs. lecture/wk. and 3 hrs. lab/wk.

HVAC 275 HVAC Code Review* (3 Hours)

This course is for the use and interpretation of the current International Mechanical Code (IMC). Upon successful completion of this course, the student should be able to interpret and apply the Code to HVAC applications. 3 hrs. lecture/wk.

HVAC 278 Advanced Electrical Systems* (3 Hours)

Prerequisites: HVAC 110.

Upon successful completion of this course, students will be able to understand and apply advanced electrical theory consisting of wiring gas and electric furnaces, air conditioners and heat pumps. This class will develop diagnostic skills associated with common heating and cooling problems found in the HVAC trade. The students will be able to examine advanced electrical wiring diagrams, understand the sequence of operations for the HVAC equipment and conduct troubleshooting methods. Control theory as applied in Direct Digital Control (DDC) HVAC systems will also be examined. 2 hrs. lecture/wk. and 3 hrs. lab/wk.

HVAC 280 HVAC Internship* (1-3 Hour)

Prerequisites: Department approval.

Upon successful completion of this course, the student should be able to apply classroom knowledge to an actual work environment. The internship will provide the students with an on-the-job experience under the supervision of industry professionals. The work will be developed in cooperation with area employers, college staff and each student to provide a variety of actual job experiences directly related to the student's career goals in the HVAC field. Minimum 15 hrs. per week on-the-job training.