HEATING, VENTILATION, AND AIR (HVA)

HVA 101 Heating, Ventilation and Air Conditioning I (4 Credits)
60 lecture, 30 lab, 4 total contact hours
This course introduces the concept of thermodynamics and principles of refrigeration. Major units covered include refrigeration systems, refrigerants, refrigerant tables, contaminants, dryers, moisture in the air, refrigeration components (i.e. compressors, condensers, evaporators, metering device motors and accessories) and defrost systems. The components and operation of residential furnaces will be discussed. An overview of heating and A/C systems and components will be provided from an operation and service perspective. HVAC mathematics will be introduced and used to convert temperatures between Fahrenheit and Celsius. Level I Prerequisite: Academic Reading and Writing Levels of 6; Academic Math Level 2 or concurrent enrollment in MTH 067

HVA 102 HVAC Sheet Metal Fabrication (3 Credits)
45 lecture, 15 lab, 3 total contact hours
In this course, students receive an introduction to layout, design and fabrication of sheet metal with an emphasis on residential HVAC applications. Topics will include safety, sheet metal tools and equipment, fabricating HVAC duct using patterns and drawings, and installation techniques, standards and good practices. This course was previously offered as four credits. Level I Prerequisite: Academic Reading and Writing Levels of 6; Academic Math Level 2

HVA 103 Heating, Ventilation and Air Conditioning II (4 Credits)
60 lecture, 30 lab, 4 total contact hours
This course covers basic electrical theory as applied to heating, ventilation, air conditioning and refrigeration systems. Students solve electrical problems, construct and troubleshoot series-parallel circuits, identify and troubleshoot electrical components, apply alternating current principles, identify, test and troubleshoot motors and motor control circuits, and interpret electrical diagrams and use them to troubleshoot HVACR systems. Level I Prerequisite: Academic Reading and Writing Levels of 6; Academic Math Level 2 or concurrent enrollment in MTH 067

HVA 105 Residential and Light Commercial Heating Systems (4 Credits)
45 lecture, 45 lab, 4 total contact hours
In this course, students build on the heating system skills and knowledge learned in prerequisite courses. Major units covered include HVAC service and preventative maintenance for residential electric, gas, oil or hydronic and heat pump systems. Students get an overview of indoor air quality, air distribution and installation concepts and techniques. Level I Prerequisite: Academic Reading and Writing Levels of 6; Academic Math Level 2 or MTH 067 may enroll concurrently; HVA 101 and HVA 103, minimum grade "C"

HVA 107 Residential and Light Commercial Air Conditioning Systems (4 Credits)
45 lecture, 45 lab, 4 total contact hours
In this course, students review basic electrical and refrigeration principles needed for maintaining and troubleshooting equipment. Sequence of operational mechanical and electrical failures is covered for residential and light commercial equipment. This includes logical diagnostic techniques which are simulated on both computer simulators and live lab equipment. Level I Prerequisite: Academic Reading and Writing Levels of 6; Academic Math Level 2; HVA 101 and HVA 103, minimum grade "C"

HVA 108 Residential HVAC Competency Exams and Codes (3 Credits)
45 lecture, 15 lab, 3 total contact hours
In this course, students will learn the relevant codes to residential heating, ventilation and air conditioning. Other topics include residential air conditioning requirements, proper operating conditions and servicing requirements. Students will take a nationally recognized competency exam upon completion of the course. Level I Prerequisite: Academic Reading and Writing Levels of 6; Academic Math Level 2; HVA 105 and HVA 107, minimum grade "C"

HVA 201 Energy Audits (4 Credits)
45 lecture, 45 lab, 4 total contact hours
This course prepares students to conduct an energy audit on residential, commercial, industrial structures and HVAC systems. Students gain an understanding of the current energy, building, and HVAC standards put out by organizations such as ASHRAE and the U.S. Green Building Council's "LEED" program. Students will also be introduced to topics such as commissioning, ducts loss, building air infiltration, heat recovery, thermal storage and energy waste elimination. Level I Prerequisite: Academic Reading and Writing Levels of 6; HVA 101 and HVA 103, minimum grade "C"

HVA 202 Air System Layout and Design (3 Credits)
45 lecture, 15 lab, 3 total contact hours
In this course, students will be introduced to HVAC duct airflow, industry standard designs, and indoor air quality issues related to health and comfort. Students will learn testing techniques to assess and troubleshoot a variety of duct systems and components. Other topics will include fan sizing and principles, duct design, and duct termination based on current Indoor Air Quality (IAQ) standards. Troubleshooting topics will include airflow conditions, indoor air quality, pressure losses and diagnosing noise issues. Level I Prerequisite: Academic Reading and Writing Levels of 6; HVA 101 and HVA 103, minimum grade "C"

HVA 203 Refrigeration Systems (3 Credits)
45 lecture, 15 lab, 3 total contact hours
This course covers commercial refrigeration systems. This includes system operation, installation, maintenance and troubleshooting. Topics covered include types of commercial refrigeration systems, evaporators, compressors, condensers, expansion devices, defrost, controls and cold storage principles. Level I Prerequisite: Academic Reading and Writing Levels of 6; HVA 108 minimum grade "C"

HVA 205 Hydronic Systems (4 Credits)
45 lecture, 45 lab, 4 total contact hours
In this course, students will gain knowledge and skills related to hydronic systems, including steam and hot water boilers. Students will identify major component; students will also analyze and inspect safety and control systems. Students will study the different piping arrays that are used for delivery of heat from a boiler. Electrical wiring of zoning systems is emphasized and practiced. Students remove, inspect and replace boiler components. Students will also learn how to do a heat loss calculation of a residential structure to ensure the boiler is the correct size when updating a system. Level I Prerequisite: Academic Reading and Writing Levels of 6; HVA 108 minimum grade "C"

HVA 207 Commercial Industry Standards with Competency Exams (3 Credits)

45 lecture, 15 lab, 3 total contact hours

In this course, students will learn the relevant codes to commercial heating, ventilation, air conditioning and refrigeration systems. Other topics include commercial air conditioning and refrigeration installation requirements, proper operating conditions and servicing requirements. Students will have the opportunity to take nationally recognized competency exams. Level I Prerequisite: Academic Reading and Writing Levels of 6; Academic Math Level 3; HVA 203 and HVA 205, minimum grade "C"