

AIR CONDITIONING AND REFRIGERATION TECHNOLOGY (601)

601-307 - Electricity and Electronics HVAC

Emphasizes fundamentals of electricity and electronics with application to heating, ventilating, air conditioning and refrigeration equipment. Provides hands-on instruction in electrical-mechanical applications. Electrical theory is studied to include the laws of Ohm's and Watt's, magnetic principles, inductance, and capacitance in circuits. Identification and construction of series, parallel and combination circuits are explored through lab experiments.

3 Credit hours

36 Lecture hours

72 Lab hours

601-308 - HVAC Schematics

Develops skills in reading wiring diagrams, ladder diagrams, block diagrams, electrical and HVAC/R symbols. Focuses on interpreting electrical/electronics and HVAC/R components in a typical circuit. (Prerequisite: Completion of or concurrent enrollment in 601-307 Electricity and Electronics HVAC)

2 Credit hours

36 Lecture hours

36 Lab hours

601-309 - HVAC/R Code and OSHA 10

Focuses on preparing the student to sit for certification tests required by federal and state governments and the Heating, Ventilation, Air Conditioning and Refrigeration (HVAC/R) industry. Students focus on EPA refrigerant-handling 608 exam. Other certification exams are also examined. The student defines goals for this class based on exam needs.

1 Credit hours

36 Lecture hours

601-310 - Fundamentals of Building Controls and Systems

Students will learn hands-on training in applications in motors and controls and studies in the movements of air specific to HVAC/R applications.

2 Credit hours

36 Lecture hours

36 Lab hours

601-314 - Commercial Refrigeration

This course provides an in-depth study of commercial and supermarket refrigeration systems, with a focus on rack systems, walk-in coolers, refrigerated cases, and ice machines. Students will learn to identify key components, safeties, and controls while gaining an understanding of how refrigeration systems adapt to changing cooling demands. Topics include CO# refrigeration and its hazards, airflow and capacity control issues, oil circulation, defrost methods, receivers, accumulators, and the differences between low, medium, and high temperature cases. Students will also explore proper system charging, diagnosing compressor problems, food safety rules, transportation methods, and the operation, cleaning, and sanitizing of ice machines. By the end of the course, learners will be able to analyze, maintain, and troubleshoot refrigeration systems used across a variety of commercial applications. (Prerequisite: 601-320 Fundamentals of Refrigeration)

3 Credit hours

36 Lecture hours

72 Lab hours

601-316 - Hydronic Environmental Systems

Focuses on the installation and troubleshooting of hydronic systems, water treatment, maintenance, control devices and service tools.

Hydronic balancing techniques are emphasized using pump laws, distribution balance methods procedures and use of instrumentation.

3 Credit hours

36 Lecture hours

72 Lab hours

601-320 - Fundamentals of Refrigeration

Focuses on the fundamental principles of refrigeration, refrigerants, the refrigeration system and control devices. Develops skills and knowledge in the diagnosis and repair of air conditioning and refrigeration systems.

2 Credit hours

36 Lecture hours

36 Lab hours

601-321 - Refrigeration Service Techniques

Develops basic skills in the use of refrigeration test instruments, tools and the application of refrigeration theory and practices to refrigeration systems. Skills applied are brazing techniques, evacuation, dehydration and charging of refrigeration systems. The effect of various metering devices is analyzed. Covers wiring of a refrigeration trainer and ways to recover refrigerant from a system using recovery machines as outlined in EPA Section 608 of the Clean Air Act. (Prerequisite: Completion of or concurrent enrollment in 601-320 Fundamentals of Refrigeration)

2 Credit hours

36 Lecture hours

36 Lab hours

601-322 - Residential Air Conditioning

Develops skills and knowledge in the diagnosis, repair and installation of air conditioning systems. Focuses on service and installation techniques for residential systems. Simulation software and actual equipment provide troubleshooting experience. (Prerequisites: 601-308 HVAC Schematics; 601-321 Refrigeration Service Techniques)

3 Credit hours

36 Lecture hours

72 Lab hours

601-323 - Residential Heating Systems

Develops advanced skills and knowledge of installation, maintenance and servicing of residential heating systems. Covers control devices, service tools, human comfort and add-on purchases. Simulation software and actual equipment provides troubleshooting experience. (Prerequisite: Completion of or concurrent enrollment in 601-308 HVAC Schematics)

3 Credit hours

36 Lecture hours

72 Lab hours

601-334 - Commercial Heating and Air Conditioning

Develops advanced skills in the preventative maintenance and repair of commercial heating and air conditioning systems. Focuses on systems, start-up, preventative maintenance, service, troubleshooting and installation. Applications center on light commercial, packaged, split and central systems. (Prerequisite: Completion of or concurrent enrollment in 601-323 Residential Heating Systems)

3 Credit hours

36 Lecture hours

72 Lab hours