

# AIR CONDITIONING AND REFRIGERATION TECHNOLOGY (601)

## **601-107 - 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

18 Lecture hours

72 Lab hours

## **601-108 - Heating, Ventilation and Air Conditioning (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 601-107 Electricity and Electronics HVAC)

2 Credit hours

18 Lecture hours

36 Lab hours

## **601-109 - HVAC/R Code**

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

18 Lecture hours

## **601-116 - 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. (Prerequisites: 601-123 Residential Heating Systems; 804-107 College Mathematics)

3 Credit hours

36 Lecture hours

36 Lab hours

## **601-118 - Air Distribution**

Focuses on commercial ventilation systems and air balance techniques. Develops skills relative to the importance of balancing, air quality, air measurement, fan laws, balance method and use of instrumentation. (Prerequisite: Completion of or concurrent enrollment in 804-107 College Mathematics)

2 Credit hours

18 Lecture hours

36 Lab hours

## **601-119 - Geothermal Heat Pumps**

Develops skills to identify and correct malfunctions of geothermal equipment, electrical systems, instrumentation, or controls. Includes explanation of geothermal theory and terminology, heat pumps and their components, earth loop types, efficiency comparisons, advantages, disadvantages, and comparisons to other HVAC equipment. (Prerequisites: 601-108 HVAC Schematics; 601-121 Refrigeration Service Techniques; 601-122 Residential Air Conditioning; 601-127 Fundamentals of Building Controls)

2 Credit hours

18 Lecture hours

36 Lab hours

## **601-120 - 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.

3 Credit hours

36 Lecture hours

36 Lab hours

## **601-121 - 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 601-120 Fundamentals of Refrigeration)

2 Credit hours

18 Lecture hours

36 Lab hours

## **601-122 - 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: 601-108 HVAC Schematics; 601-121 Refrigeration Service Techniques; 890-101 College 101. Completion of or concurrent enrollment in 103-159 Computer Literacy – Microsoft Office)

3 Credit hours

18 Lecture hours

72 Lab hours

## **601-123 - 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: 601-108 HVAC Schematics)

3 Credit hours

18 Lecture hours

72 Lab hours

**601-126 - Residential Energy**

Develops skills to conduct an energy efficiency evaluation of a house by using the house-as-a-system approach. Examine comfort and safety issues for the inhabitants. Recommend heating and air conditioning equipment that matches the heating and cooling loads calculated. Students will provide a report that details corrective actions needed to prioritize energy retrofit work for the house that can be used for weatherization.

3 Credit hours

18 Lecture hours

72 Lab hours

**601-127 - Fundamentals of Building Controls**

Enhances skills in schematic wiring diagram interpretation and provides instruction in the fundamental concepts of building control systems.

Hands-on simulations and actual systems are used to extensively enhance the concept of control systems.

2 Credit hours

18 Lecture hours

36 Lab hours

**601-128 - Building Control Systems Applications**

Enhances skills in schematic wiring diagram interpretation. Provides hands-on instruction in electro-mechanical building control, pneumatic control and electronic control of building systems. Hands-on simulators and actual systems are used to extensively enhance concepts of control systems. (Prerequisites: 601-108 HVAC Schematics; 601-127 Fundamentals of Building Controls)

3 Credit hours

18 Lecture hours

72 Lab hours

**601-129 - Commercial Food Service Refrigeration**

Focuses on advanced principles of refrigeration, refrigerants, the refrigeration system, control devices and service tools as they apply to food service equipment. Reviews basic refrigeration, the accessory devices that make up commercial refrigeration systems, design concepts, defrost system, system configurations and operating principles. (Prerequisite: 601-121 Refrigeration Service Techniques)

3 Credit hours

18 Lecture hours

72 Lab hours

**601-130 - Supermarket Refrigeration**

Focuses on advanced principles of refrigeration, refrigerants, the refrigeration system, control devices and service tools. Develops skills in installation, start-up, preventative maintenance and the diagnosis of commercial refrigeration systems. Provides a practical problem-solving approach to everyday situations that confront the refrigeration technician. (Prerequisite: 601-129 Commercial Food Service Refrigeration)

3 Credit hours

18 Lecture hours

72 Lab hours

**601-134 - 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 601-123 Residential Heating Systems)

4 Credit hours

36 Lecture hours

72 Lab hours