



South Central College

# HVAC 2240 Central Air Conditioning

## Common Course Outline

### Course Information

**Description** This course covers the different central air conditioning systems found in residential and light commercial applications today. The electrical and mechanical systems will be studied and analyzed along with troubleshooting and safety procedures. The students will then apply this knowledge by using proper troubleshooting techniques for testing electrical and mechanical operations in the lab.

**Total Credits** 2

**Total Hours** 48

### Types of Instruction

#### Instruction Type

#### Credits/Hours

Lecture

Lab

### Pre/Corequisites

HVAC2100, HVAC2000 or Instructor Approval.

### Institutional Core Competencies

**Civic Engagement and Social Responsibility** - Students will be able to demonstrate the ability to engage in the social responsibilities expected of a community member.

**Communication** - Students will be able to demonstrate appropriate and effective interactions with others to achieve their personal, academic, and professional objectives.

**Critical and Creative Thinking** - Students will be able to demonstrate purposeful thinking with the goal of using a creative process for developing and building upon ideas and/or the goal of using a critical process for the analyzing and evaluating of ideas.

**Cultural Competence** - Students will be able to demonstrate an attitude of personal curiosity, a rising knowledge of cultures, and an evolving range of skills for living and working among others with other worldviews and ways of life.

### Course Competencies

1. **Examine safety considerations for the electrical and the refrigerant hazards related to servicing**

## **air conditioning equipment.**

### **Learning Objectives**

Review electrical shock hazards.  
Review the hazards of refrigerants.  
Discuss the hazards of higher modern refrigerant pressures.

## **2. Investigate the high voltage and low voltage electrical systems.**

### **Learning Objectives**

Draw a low voltage diagram.  
Draw a line voltage diagram.  
Describe a hard start kit and its purpose.  
Review a permanent split capacitor motor.

## **3. Identify compressor types.**

### **Learning Objectives**

Describe a reciprocating compressor  
Describe a rotary compressor.  
Describe a scroll compressor.  
Study other types of compressors used in larger commercial settings.

## **4. Explain the different types of evaporator coils and their design advantages.**

### **Learning Objectives**

Recognize the advantages and dis-advantages of cased and uncased evaporator coils.  
Compare micro-channel coils to standard tube and finned coils.  
Review the three common types of evaporator coils.

## **5. Examine metering devices.**

### **Learning Objectives**

Describe the fixed orifice type metering devices.  
Summarize the advantages of expansion devices.  
Explain the most common method of refrigerant charge measurement used with which type of metering device and why.

## **6. Determine the correct refrigerant charge.**

### **Learning Objectives**

Describe the superheat method for checking refrigerant charge.  
Describe the subcooling method for checking refrigerant charge.  
Explain the use of testing equipment for determining the correct refrigerant charge.

## **7. Outline practices that provide for a quality installation.**

### **Learning Objectives**

Express the need and purpose of a filter drier.  
Recognize good locations for condensing units.  
Identify practices that provide for a professional installation.

## **8. Explore accessories that may be added to an air conditioning system.**

### **Learning Objectives**

Explain a low ambient lockout control and where it would be used.  
Describe a fan cycling system and its advantages and dis-advantages.  
Describe a condenser fan speed control and its advantages and dis-advantages.  
Study the time delay relay used to protect the compressor.

## **SCC Accessibility Statement**

Disability Services provides accommodations and other supports to students with permanent and temporary disabilities that affect their SCC experience. Disabilities may include mental health (anxiety, depression, PTSD), ADHD, learning disabilities, chronic health conditions (migraine, fibromyalgia), sensory disabilities, and temporary disabilities (broken arm,

surgery). Common accommodations are extended test time, private room for testing, audiobooks, and sign language interpreter.

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