



South Central College

# HVAC 2325 Commercial Package Heat/Cool Units

## Common Course Outline

### Course Information

**Description** This course covers the different commercial packaged heating and cooling systems found in residential, commercial and industrial applications. The electrical, mechanical systems will be studied and analyzed along with troubleshooting and safety procedures. The principle and operation of economizers and their controls will be discussed in class. The student will then take this knowledge and apply it in the lab. To be successful in this class the student will need to be enrolled in the HVAC program and be in their second or third semester.

**Total Credits** 2

**Total Hours** 48

### Types of Instruction

#### Instruction Type

#### Credits/Hours

Lecture

Lab

### Pre/Corequisites

None

### 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 issues related to safety when working on commercial equipment.**

**Learning Objectives**

Review Ladder safety.  
Outline securing the ladder to the roof.  
Describe communication with a crane.  
Identify crane signals.  
Recognize the importance of knowing where power lines are.  
Detail the dangers that weather can bring when working on roofs and outside.  
Elaborate on working alone on rooftop equipment.

**2. Compare air filtration systems.**

**Learning Objectives**

State the purpose of a condensate trap as it relates to filters.  
Discuss issues affecting filter maintenance.

**3. Explore economizer systems.**

**Learning Objectives**

Trace an electrical diagram of an economizer.  
Detail the operation of an enthalpy control.  
Discuss ventilation air requirements and settings.  
Recognize the advantages of free cooling.

**4. Investigate control systems.**

**Learning Objectives**

Explain energy management systems.  
Compare commercial temperature controls with residential temperature controls.  
Recognize multi-stage temperature control and systems that utilize multi-stages of heating and cooling.

**5. Examine low voltage circuits.**

**Learning Objectives**

Study schematics.  
Compare commercial equipment schematics with residential equipment schematics.

**6. Examine Line voltage circuits.**

**Learning Objectives**

Study schematics  
Explain Multi tap transformers.  
Outline some issues with 480 volt systems.  
Describe the purpose of phase protectors.  
Elaborate on the advantages of three phase systems.

**7. Explore gas heating systems as they relate to commercial rooftop units.**

**Learning Objectives**

Compare combustion air proving systems.  
List the types of ignition systems used on commercial packaged units.  
Detail issues with gas regulators exposed to weather.

**8. Analyze preventative maintenance.**

**Learning Objectives**

Recognize the need for preventative maintenance.  
List preventative maintenance tasks.  
Review the process of keeping good records.

**9. Demonstrate what is required for an initial start up of packaged heat/cool units.**

**Learning Objectives**

List mechanical checks.  
List electrical checks.

Interpret lab unit super-heat.  
Interpret lab unit sub-cooling.

### **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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