



South Central College

# HVAC 2215 Coolers/Freezers Refrigeration Diagnostics & Operations

## Course Outcome Summary

### Course Information

<b>Description</b>	This course will cover both commercial coolers and freezers. We will discuss the operation of the refrigeration sealed system and analyze how to diagnose system failures and their causes. The student will learn the proper way to recover and charge a commercial refrigeration unit. The students will study and follow EPA regulations regarding the handling of refrigerants. Proper safety and troubleshooting techniques will be followed. To be successful in this course, you should have knowledge in electrical circuits, refrigeration theory, and refrigeration controls.
<b>Total Credits</b>	3
<b>Total Hours</b>	80

### Types of Instruction

Instruction Type	Credits/Hours
Classroom Presentation	1
On-Campus Lab	2

### Pre/Corequisites

HVAC2120

### 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 requirements while working with refrigerants.

#### Learning Objectives

Communicate what safety equipment is needed while working with refrigerants.  
Demonstrate wearing the proper safety equipment while working with refrigerants.

### 2. Examine refrigerants used for medium & low temperature applications.

#### Learning Objectives

Review the different temperature application zones.  
Identify the refrigerants by the color of the tank.  
Identify what refrigerant works best for the application.  
Use and understand a pressure temperature chart.

### 3. Examine different defrost methods for commercial units.

#### Learning Objectives

List the best methods for defrosting commercial units.  
Compare and discuss the different ways of defrosting commercial units.

### 4. Examine the access valves and stem positions.

#### Learning Objectives

Identify the different service access valves found on commercial units.  
Describe what the different positions of the service access valves are and what is their function.  
troubleshoot service access valve problems.

### 5. Demonstrate installing and removal of refrigerant gauges correctly.

#### Learning Objectives

Connect refrigerant gauges to system using EPA guidelines.  
Remove refrigerant gauges using EPA guidelines.  
Use proper safety equipment while working with refrigerants.

### 6. Explain the pump-down procedure and function.

#### Learning Objectives

Describe the purpose for doing a pump-down.  
Demonstrate on a working unit the pump-down procedure.  
Describe what has to be done when you can't pump-down the system.

### 7. Analyze refrigerant components that are only found on commercial units.

#### Learning Objectives

Explain the function of EPR and CPR valves.  
Discuss pressure controls and how to set them.  
Discuss the different types of metering devices used on commercial equipment.  
Explain the uses of refrigerant solenoids.

### 8. Measure proper refrigerant charge in a walk-in unit.

#### Learning Objectives

Describe the procedure for measuring refrigerant in a system.  
Demonstrate how to check refrigerant level in a system.

### 9. Examine reasons for sealed system failures.

#### Learning Objectives

List complaints and then solutions for sealed system failures.  
Identify situations that could cause system failures.

### 10. Diagnose refrigeration sealed system failures on commercial units.

#### Learning Objectives

Follow all safety rules while troubleshooting.

Troubleshoot failures that have been introduced into the lab equipment by your instructor.  
Articulate to the customer what they did to the unit.  
Use your test equipment properly.

### **SCC Accessibility Statement**

South Central College strives to make all learning experiences as accessible as possible. If you have a disability and need accommodations for access to this class, contact the Academic Support Center to request and discuss accommodations. North Mankato: Room B-132, (507) 389-7222; Faribault: Room A-116, (507) 332-7222.

Additional information and forms can be found at: [www.southcentral.edu/disability](http://www.southcentral.edu/disability)

This material can be made available in alternative formats by contacting the Academic Support Center at 507-389-7222.