



South Central College

HVAC 2010 1 Phase Motors and Controls

Course Outcome Summary

Course Information

Description	The course will introduce the student to the different types of single-phase and three phase AC motors used on HVAC/R equipment. Motor starting devices and motor protection devices will also be covered in depth. From an electrical controls schematic the student will connect and wire motors in start-stop circuits, reversing circuits and three phase circuits. The student will learn to electrically troubleshoot motors and motor control circuits utilizing motor wiring schematics. 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
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Lecture	
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Lab	
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Pre/Corequisites

None

Institutional Core Competencies

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.

Course Competencies

1. **Examine safety procedures used when trouble-shooting electrical circuits.**

Learning Objectives

List the proper use of meter to check if voltage is present.

Explain methods of safely using meters during live power trouble-shooting.

Discuss pinch points and physical hazards.

2. Recognize the five common types of single phase motors.

Learning Objectives

Describe a shaded pole motor.
Describe a split phase motor.
Describe a permanent split capacitor.
Describe a capacitor start Induction run motor.
Describe a capacitor start capacitor run motor.

3. Identify motor winding utilizing a multi-meter.

Learning Objectives

Identify winding overload devices.
Analyze Run winding resistance.
Analyze Start winding resistance.
Review motor terminal designations.

4. Illustrate how to connect run and start capacitor in a motor starting circuit.

Learning Objectives

Draw a run capacitor circuit.
Draw a start capacitor circuit including the starting components.
Test a run and start capacitor for correct microfarad rating.
Wire a run capacitor in a start stop motor circuit.

5. Interpret motor control circuits and electrical schematics.

Learning Objectives

Draw motor control circuits.
Examine start and stop control stations.
Wire a start and stop control station.
Wire a forward and reverse motor control circuit.

6. Examine three phase motors and power systems.

Learning Objectives

Study the three phase power system.
State the advantages of three phase power.
Identify motor terminals on three phase motors.
Draw three phase motor windings and terminals.
Wire three phase motor circuits.

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

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