



South Central College

## AST 2822 Heating & Advanced A/C

### Course Outcome Summary

#### Course Information

<b>Description</b>	This course covers automatic temperature control systems operation, testing and repairs of vacuum and electrical controls, air flow distribution, and heater system controls. (Prerequisites: Admission into the Automotive Service program and AST 2812 or instructor approval)
<b>Total Credits</b>	2
<b>Total Hours</b>	48

#### Types of Instruction

Instruction Type	Credits/Hours
Lecture	1/16
Lab	1/32

#### Pre/Corequisites

Admission into the Automotive Service program

#### Institutional Core Competencies

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. Exhibit professionalism**

**Learning Objectives**

Identify safety procedures  
Identify air conditioning safety

**2. Inspect A/C condenser air flow restrictions; determine necessary action**

**Learning Objectives**

Inspect, test, cooling fan, fan clutch, fan shroud, and air dams: perform necessary action  
Inspect and test electric cooling fan, fan control system, and circuits; determine necessary action  
Inspect cooling system, level, coolant condition, hoses, and leaks

**3. Diagnose temperature control problems in heater and ventilation system; determine necessary**

## **action**

### **Learning Objectives**

Identify mechanical heater controls

Identify heater electrical controls

Inspect, test, or replace heater control cable, motors, and linkage; perform necessary action

Inspect and test heater control valves, drainback valves; determine necessary action

Identify coolant control valves/hose routings

Determine procedure to remove, inspect, reinstall, and/or replace heater core

## **4. Diagnose malfunctions in HVAC system electrical components and controls**

### **Learning Objectives**

Inspect / test heater blower / resistors / switch's / relays / wiring / and protection devices

Replace heater blower components

Diagnose A/C system conditions that cause the protection devices (pressure, thermal, and/or control module) to interrupt system operation; determine needed action

Test and diagnose HVAC compressor clutch control system; determine necessary action

## **5. Inspect, test, and / or replace A/C compressor clutch components and / or assembly; check compressor clutch air gap and adjust as needed**

### **Learning Objectives**

Replace one piece compressor seal

Replace multi-piece compressor seals

## **6. Diagnose heater / air conditioning system operation**

### **Learning Objectives**

Inspect and test HVAC control panel assembly; determine necessary action

Remove / inspect A/C system mufflers / hoses / lines / fittings / O-rings / seals and service valves

Remove, inspect and / or replace evaporator; determine required oil quantity

Remove, inspect and / or replace receiver drier or accumulator; determine correct oil and quantity

Remove, inspect and / or replace A/C condenser; determine required oil quantity

Test, remove, and install expansion valve or orifice tube

## **7. Diagnose malfunctions in HVAC system vacuum and mechanical components and controls**

### **Learning Objectives**

Identify air flow

Explain HVAC vacuum system controls

Inspect HVAC ducts, doors, hoses, cabin filters, and outlets; perform necessary action

Test vacuum components

## **8. Diagnose malfunctions in the electrical controls of HVAC systems; determine necessary action**

### **Learning Objectives**

Diagnose HVAC automatic or semi-automatic control systems; determine necessary action

Using scan tool, observe and record related HVAC data and trouble codes

## **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.

