



South Central College

HVAC 2320 Gas Heat

Course Outcome Summary

Course Information

Description	This course covers the forced air gas heating systems found in residential and light commercial applications. 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. To be successful in this class the student should take HVAC2100 and HVAC 2000 before or concurrent.
Total Credits	3
Total Hours	80

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. Identify practices and procedures used to enhance safety for the technician and home owner.

Learning Objectives

Recognize the characteristics of natural gas.
Recognize the characteristics of propane.
Review electrical shock hazards.
Indicate pinch points.
Detail the steps that should take place before leaving a homeowners property to insure safety.

2. Outline methods of venting and bringing in combustion air.

Learning Objectives

Recognize the importance of proper combustion air
Detail the use of venting tables.
Summarize pvc venting and combustion air.

3. Interpret BTU firing rate and efficiency.

Learning Objectives

Convert Input and output BTU firing rates.
Detail furnace efficiencies.

4. Analyze air filter system.

Learning Objectives

Clarify the main purpose of air filters.
Study other types of filtration systems.
Predict the result of poor filter maintenance.
Discuss high limit switch operation.

5. Examine room thermostats and their operation.

Learning Objectives

Explain color code used in thermostat circuits.
List components energized by each terminal on thermostat.
Describe common thermostat problems.
Study the mechanical/electrical thermostat.
Detail testing the anticipator.
Study the electronic thermostat.
Compare set back thermostats.

6. Draw furnace wiring diagrams.

Learning Objectives

Reproduce a drawing of a standing pilot furnace.
Trace out the components in a hot surface ignition diagram.

7. Examine Ignition systems.

Learning Objectives

Explain the standing pilot ignition system.
Explain the intermittent pilot ignition system.
Explain the hot surface ignition system.
Explain the direct spark ignition system.

8. Identify and explain controls and electrical components.

Learning Objectives

Examine low voltage circuits.
Examine line voltage circuits
Describe the purpose of a gas valve.
Describe the purpose of a pressure switch.
Describe the purpose of a high limit switch.
Describe the purpose of a roll out switch.
Describe the purpose of an auxiliary limit switch.
Describe the purpose of a combustion blower.
Describe the purpose of a draft diverter.

Describe the purpose of a main blower.
Describe the purpose of an ignitor.
Describe the purpose of a fan limit switch.

9. Test temperature rise.

Learning Objectives

Recognize what can happen with improper temperature rise.
Summarize airflow issues and how it relates to temperature rise.
Interpret meter information to determine temperature rise.
Adjust fan speed to set proper temperature rise.

10. Troubleshoot furnaces.

Learning Objectives

Study sequence of operation for trouble shooting.
Translate trouble shooting flow charts.
Convert diagnostic light codes for trouble shooting.
Interpret system problems utilizing electrical multi-meter.

11. Complete furnace tests used in preventative maintenance and start up.

Learning Objectives

Test temperature rise.
Test gas pressure.
Test flame signal strength.
Test anticipator amperage.
Test blower amperage.
Test pressure to pressure switch.
Test combustion.

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.