

**Course Objectives/Course Outline  
Spokane Community College**

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**Course Title: Heating Systems Servicing and Troubleshooting**

**Prefix and Course Number: AIRC 137**

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This course introduces the basic controls and control systems found on most residential HVAC systems. Electrical and mechanical functions of the individual components and their relationship to a complete system are emphasized.

**Course Learning Outcomes:**

**By the end of this course, a student should be able to:**

- identify how temperature is sensed
- demonstrate the ability to select the proper thermostat for a given application
- install and properly wire a thermostat
- explain the temperature control circuit
- recognize and describe the components in and the types of combination gas controls
- select and install an ignition system on fuel gas burning equipment
- explain the functions of a zoning system
- explain the functions of a two stage system
- demonstrate the ability to perform basic service on a unitary system
- demonstrate the ability to perform basic service on an electric heat system
- demonstrate the ability to perform basic service on a gas fired system

**Course Outline:**

- I. Basic Service Procedures
  - A. Air Adjustments
  - B. Flame Diagnosis
  - B. IP Systems
  - C. Hot Surface Systems
  - D. Ignition Control Systems
  - E. Sequence of Control Systems
- II. Thermostats
  - A. Differential
  - B. Cycle Rate
  - D. Response Time
  - E. Thermal Lag
  - F. Over Shoot
  - G. Anticipation
  - H. Droop
  - I. Programming
- III. Unitary Systems
  - A. Controls
  - B. System Servicing
  - C. Applications
- IV. Electric Heat Systems
  - A. Controls
  - B. System Servicing
  - C. Applications
- V. Zoning Systems
  - A. Controls

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- B. System Servicing
- C. Applications

VI. Air Handling and Units and Duct Heaters

- A. Controls
- B. System Servicing
- C. Applications

VII. Combination Gas Controls

- A. Manual Shut Off
- B. Pressure Regulation
- C. Ignition
- D. Safety Lock Out
- E. Over Temperature Control

VIII. Warm Air Control Systems

- A. Zoning Control
- B. Program and Operation

IX. Circuitry

- A. Thermostats
- B. Transformers
- C. Fan Switches
- D. Limit Switches
- E. ECO Switch
- F. Indoor Fan Motors
- G. Spill Switches
- H. Roll-out Switches
- I. Pressure Switches
- J. Vacuum Switches