

Course Objectives/Course Outline
Spokane Community College

Course Title: System Performance Testing

Prefix and Course Number: AIRC 205

Learning/Performance Expectations (e.g., outcomes, performance objectives, competencies, etc.)

This is a continuation of AIRC 204 (Refrigeration System Diagnostics). Additional subjects and labs include the measurement of system performance through air flow, critical charge, charging tables for air conditioning systems, and combustion analysis for combustion appliances. Heat transfer in buildings and calculation of heat load will also be covered, focusing on the building as a system. Continued study of psychrometrics and its effect on the refrigeration system and human comfort will also be explored. Labs will assist students in the study of compressor replacements, system evaluation, electric motors in refrigeration systems, motor protective devices and troubleshooting system problems. Safety codes and compliance will also be covered.

Course Learning Outcomes:

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

- Plan and carry out a course for diagnosing system problems
- Diagnose compressor malfunctions
- Diagnose typical problems in a refrigeration system
- Describe most common causes of system failure and make recommendations for repair
- Troubleshoot electrical system
- Know quantities of correct airflow for systems
- Perform airflow measurements
- Diagnose typical airflow problems
- Measure and adjust airflow

Course Outline:

- I. Advanced refrigeration troubleshooting
 - A. Electrical troubleshooting
 - B. Safe procedures when troubleshooting an electrical system
 - C. Diagnose compressor malfunctions
 - D. Mechanical refrigeration troubleshooting
 - E. Troubleshooting the compressor
 - F. Analysis of a dead compressor
 - G. Troubleshooting metering devices
 - H. Troubleshooting evaporators and condensers
 - I. Refrigeration system problems
 - J. Problem analysis of system
 - K. Charging capillary systems
 - L. Charging TXV systems
 - M. Charging water-cooled systems
- II. Airflow
 - A. Air balancing instruments
 - B. Measuring airflow
 - C. Interpreting air pressures
 - D. Fan curves
 - E. Measuring and adjusting airflow

- F. Implementing air diagnostics
- G. Troubleshooting airside problems
- H. Effects of airside problems

III. Combustion

- A. Combustion basics
- B. Draft
- C. Theoretical air curve
- D. Combustion efficiency