Course Objectives/Course Outline
Spokane Community College

Course Title: Control Theory and Automation
Prefix and Course Number: AIRC 262

This course introduces the fundamentals of control theory and applications. The student sets up and runs economizer system, use a psychrometric chart, learn the common terms of basic DDC controls, interfaces basic controls with computer and programs thermostat with both computer and command display.

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

- describe the parts and their function of an economizer
- use a psychrometric chart to plot relative humidity, dew point, etc
- wire and program thermostat for operation of two stage cooling with economizer
- identify the common terms used with DDC systems
- identify common elements of a DDC system (e.g., sensors, motors, switches, etc.)
- identify different configurations of communication networks
- describe the differences between different communication protocols (e.g., RS232, 20 mA, RS485, etc.)
- set up and program a T7300F communicating thermostat with command display
- set up and program a T7300F communicating thermostat with computer

Course Outline: Control Theory and Automation

I. Economizer
   A. Parts and Their Function
   B. Psychrometric Charts and Economizer Controls
   C. Thermostat Economizers
   D. Thermostat for Two-Stage Cooling Operation

II. Common Terms
   A. Analog Inputs
   B. Analog Outputs
   C. Digital (Binary) Inputs
   D. Digital (Binary) Outputs
   E. Tri-state (Floating/Incremental)
   F. Address
   G. Analog/Modulating/Continuous
   H. Digital/Binary/Discrete
   I. External Point
   J. Global Point
   K. Input
   L. Sensor
   M. Transducer
   N. Transmitter

III. Communications Networks and Protocol
   A. 20 mA
   B. RS 232

C. RS 485
D. RS 422
E. Network Configurations

IV. Command Display
   A. Program Thermostat Set Points
   B. Program Occupied/Unoccupied Periods
V. Computer Interface.
   A. Program Thermostat Set Points
   B. Program Occupied/Unoccupied Periods