Course Title: Machine Controls
Prefix and Course Number: FLPT 123 – Revised fall 2013

Learning/Performance Outcomes:
By the end of this course, a student should:
- read and draw relay logic electrical control schematics for fluid powered machines
- write a sequence of operation (including operator functions) for an automated machine
- identify all electrical components commonly used in machine control (found in control panel)
- write simple machine control program for Mini PLC (Allen Bradley)
- have command of an adequate electrical vocabulary for industry

Course Outline

I. Industrial Plant Electrical Power
   A. Type available
      1. Power voltages used
      2. Machine control voltages used

II. Schematic differences--hydraulic and electrical
   A. Ladder type electrical schematic
   B. Electrical wiring diagram

III. Solenoid Operated Directional Valve
    A. Electrical requirements
       1. Coil voltage
       2. Type electrical signal required
          a. momentary
          b. sustained
       3. Two position valve
          a. single solenoid
          b. double solenoid
             1) electrical interlock
       4. Three position valve

IV. Automated Machine
   A. Identified
   B. Frame
   C. Moveable mechanical parts
      1. Linear
      2. Rotary
   D. Actuators
      1. Location on machine
      2. Mounting type (style)
   E. Valves used
      1. Mechanically operated
      2. Electrically operated
      3. Location on machine
   F. Power unit
      1. Electrical motor
      2. Control panel (motor starter)
      3. Location
G. Electrical control
   1. Limit switches
      a. location
      b. function
   2. Push buttons
      a. location
      b. function
      c. push button panel
   3. Control panel
      a. relays
      b. timers
      c. location

H. Fluid line
   1. Routing on machine frame

I. Electrical conduit
   1. Types used

V. Typical Control Panel
A. Relay Logic
   1. Components used
      a. function
      b. voltage
   2. Location
      a. machine
      b. building

B. Programmable Controller

VI. Electrical Components
A. Identify
B. Electrical Specifications
C. Application
D. Schematic Symbol & Terminology

VII. Electrical Schematic
A. Rules for drawing
B. Reading and interfacing with hydraulics
C. Study basic circuits
D. Convert to PLC program

VIII. Vocabulary