University of Arkansas - Fort Smith
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General Syllabus

EETE 35103 Advanced PLC Control Systems

Credit Hours: 3 Lecture Hours: 2 Laboratory Hours: 2

Prerequisite: AMST 25103 PLC Applications or consent of department head.

Effective Catalog: 2018-2019

I. Course Information

A. Catalog Description

Covers Allen Bradley Control Logix design, selection, wiring, programming and trouble-shooting, using the Control Logix PLC controls. Emphasizes the selection of PLC system components and the design/trouble-shooting of wiring/ladder logic PLC programs to control typical industrial automated systems.

B. Additional Information

This course is an upper division, technical elective for students, who have the required prerequisites, pursuing Bachelor's degrees in Applied Science or Electrical Engineering Technology or the AAS degree in Electronics Technology. It may also be taken by working engineers/technicians to upgrade their PLC skills, if they meet the required prerequisites.

II. Student Learning Outcomes

A. Subject Matter

Upon successful completion of this course, the student will be able to:

1. Design word/file data transfer blocks for recipe selection or multi-mode control.
2. Apply PLC to scale/convert numeric analog/digital data to binary/ BCD/decimal.
3. Design program to track position and accept/reject bottles in automated filler operation, using time/event driven shift-register or sequencer.
4. Select, wire and program data acquisition components for PLC systems.
5. Configure and tune closed-loop, proportional, analog PID control blocks.
6. Solve PLC application problems using Control Logix 5000 forcing and diagnostic functions.

B. University Learning Outcomes

This course enhances student abilities in the following areas:

Analytical Skills

Critical Thinking – Students will determine optimal solutions to problems drawn from a variety of typical automated control systems.

Quantitative Reasoning – Students will convert, scale and calculate process transducer measurements and solve control problems. Students will interpret the schematic and mathematical formula models.

III. Major Course Topics

A. Data files, words and bit arrays in the Control Logix PLC's
B. Commissioning of a Control Logix system
C. Device net setup and usage of devices
D. Ethernet IP setup and usage of PowerFlex drives
E. Analog inputs/outputs with PID control block applications
F. PID process control loops: configuration/tuning/troubleshooting (temp/ pressure/speed)
G. PLC data communication using RS-232/DH-485/DeviceNet /Ethernet IP