

University of Arkansas - Fort Smith
5210 Grand Avenue
P. O. Box 3649
Fort Smith, AR 72913-3649
479-788-7000

General Syllabus

ELEC 2513 PLC Applications

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

Prerequisite: ELEC 1263 Industrial Electricity

Effective Catalog: 2018-2019

I. Course Information

A. Catalog Description

Provides the engineer or technician with an overview of the selection, programming, operation, and capabilities/limitations of programmable logic controllers.

B. Additional Information - None

II. Student Learning Outcomes

A. Subject Matter

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

1. Describe typical PLC I/O modules to include all essential details.
2. Download PLC programs and verify their correct operation.
3. Program and operate "on-line" a simple ladder diagram program to replace timer/relays, according to the instructor's specifications.
4. Troubleshoot and repair failures in PLC I/O modules using the resources of the PLC lab.
5. Define design requirements for memory size, scan time, update time and I/O modules for a control application.
6. Describe the system interface requirements for communication from PLC to PLC; PLC to remote rack; and PLC to host computer.
7. Accurately wire PLCs and related control circuits in compliance with industry approved safety rules and procedures.

B. University Learning Outcomes

This course enhances student abilities in the following areas:

Analytical Skills

Critical Thinking Skills-Students will analyze and troubleshoot failures in PLC I/O modules using the resources of the PLC lab.

Communication Skills (written and oral)

Students will effectively document and communicate PLC I/O modules to include all essential details.

III. Major Course Topics

- A. Introduction to Programmable Logic Controllers (PLCs)
- B. Basic Number Systems Overview
- C. Logic/Relay Ladder Diagram Concepts
- D. Block Diagram of PLC
- E. PLC Input/Output System
- F. Programming Simple I/O
- G. Programming Advanced I/O
- H. Programming Timers/Counters
- I. Documentation and On-Line Diagnostics
- J. Major Vendor PLC CPU Overview
- K. Major Vendor I/O Options and Selection Criteria
- L. Selecting a PLC for Replacement Applications
- M. Definition of a PLC for Critical Applications
- N. Data Highways and Communication Links
- O. Installation, Start-up and Maintenance of PLCs