ELEI 212 Programmable Controllers

3 Credits

Community College of Baltimore County Common Course Outline

Description

ELEI 212 – Programmable Controllers: provides an in-depth study of commonly used industrial programmable logic controllers (PLC) and programming methods. The application and troubleshooting of PLC systems is emphasized along with hands-on experience in the lab portion of the course using the software and hardware provided.

Pre-requisites: ELEI/ENSC 114 and ELEI/ENSC 204 or consent of the program coordinator

Overall Course Objectives

Upon completion of this course, students will be able to:

- 1. analyze the hardware organization and operation of a PLC system;
- 2. describe the interaction of a PLC and a Distributed Control System (DCS) in plant automation systems;
- 3. analyze PLC relay logic;
- 4. analyze ladder logic diagrams;
- 5. write PLC ladder logic programs using basic instructions;
- 6. use math instructions to develop PLC applications;
- 7. use counter and timer instructions to develop PLC applications;
- 8. use data manipulation instructions to develop PLC applications;
- 9. capture and transform event data to manipulate actuators;
- 10. analyze different methods for which a PLC are used in process control;
- 11. analyze different schemes for which networked PLCs are used for plant floor applications;
- 12. troubleshoot PLC logic programs; and
- 13. diagnose PLC software and hardware faults.

Major Topics

- I. PLC hardware and systems
 - a. Processors
 - b. Power supply
 - c. Memory
 - d. I/O
- II. PLC programming
 - a. Analog and discrete I/O systems
 - b. Special function I/O
 - c. Serial communications
- III. Designing relay and ladder diagram applications

The Common Course Outline (CCO) determines the essential nature of each course. For more information, see your professor's syllabus.

- a. Using timer instructions
- b. Using counter instructions
- c. Using math instructions
- IV. Capturing and transforming event data
- V. Diagnosing PLC software and hardware faults
- VI. Process and plant systems

Course Requirements

Grading will be determined by the individual faculty member, but shall include the following, at minimum:

- Six homework assignments
- Six quizzes
- Three labs
- Midterm exam
- Final exam

Date Revised: 12/7/2021