

Department of Technology
Summer 2005

EET 351
PROGRAMMABLE LOGIC CONTROLLERS

Instructor:

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Office:

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Class schedule:

Section: 001, CRN: 51562; MW: 2 pm – 4.30 pm, Room 404

Office Hours:

MTWR: 12.30 pm – 2 pm. If my office door is open at other times I will most likely be available for discussion. Come right in.

Credit hours:

3

Prerequisite:

EET 251 and EET 252

COURSE DESCRIPTION:

The course consists of the study of Programmable Logic Controllers (PLC). The PLC functioning theory, the PLC selection for an application, and the PLC wiring and programming are covered in this course.

TEXTBOOK:

Programmable Logic Controllers Hardware and Programming; Max Rabiee, Goodheart-Wilcox publishers; 2002; ISBN: 1-56637-873-7

Reference:

Allen-Bardley SLC500™ Programmable Logic Controller, Max 2000, Lincolnshire, IL. Energy Concepts Incorporated (ECI); 2000

COURSE OBJECTIVES:

Upon completing EET 351 the student should be able to:

- A. List the essential components found in a Programmable Logic Controller (PLC) system.
- B. Read and use manufacturer specifications in the selection of PLCs for specific application.
- C. Describe the hardware characteristics of the SLC 500 series, Allen-Bradley family of Programmable Logic Controllers.
- D. Read and understand the specifications for the PLC input/output ports.
- E. Discuss the use of memory and I/O mapping in the SLC 500 Programmable Logic Controller system.
- F. Explain the difference between contacts, relays, and switches in the PLC system.
- G. Explain the difference between the Normally Open (NO), and the Normally Closed (NC) contacts, and switches. Utilize the (NO) and the (NC) contacts and switches in an application.
- H. Discuss the temperature switch, the limit switch, the level switch, the pressure switch, the flow meter switch, and other industrial control switches.
- I. Discuss the timer relays, the on-delay timer contact, the off-delay timer contact, the counter relays, and the counter contacts.
- J. Discuss the use of the solenoid in industry.
- K. Write, debug, and run PLC programs to implement the use of aforementioned relays, contacts, switches, timers, and counters.
- L. Discuss the use of PLC Programming commands SKIP, MASTER CONTROL RELAY (MCR), JUMP (JP), and JUMP SUBROUTINE (JSR).
- M. Discuss the DATA MOVE.
- N. Discuss Trouble shooting, and servicing - procedures and techniques for troubleshooting PLC systems.

COURSE OUTLINE:

- A. Sensors and actuator symbols
- B. Number systems and codes
- C. Programmable Logic Controller (PLC) block diagram
- D. PLC Programming Procedures
- E. Selecting and Purchasing a PLC
- F. Basic PLC programming
- G. Creating Ladder Diagrams from Process-Control Description
- H. PLC Timer Functions
- I. PLC Counter Functions
- J. Arithmetic and Logic Functions
- K. The SKIP, the MASTER CONTROL RELAY (MCR) Functions
- L. The JUMP (JP), and the JUMP SUBROUTINE Functions
- M. The DATA MOVE Function
- N. Trouble shooting and servicing the PLC systems

COURSE REQUIREMENTS:

Student are expected to:

- Attend each lecture and laboratory session.
- Complete all assignments and laboratory activities on time.
- Take all assessments.
- Maintain a 3-ring, 1.5” binder, or folder for organizing class materials.

EVALUATION:

Each student will be evaluated as follows:

- 3 Assessments (40%),
- 12-15 Lab assignments (40%),
- 5 Homeworks (10%)
- 2 papers or 1 PLC project (10%)

Attendance Policy:

After the second unexcused absence, each unexcused absence will cause one percent deduction. Four (4), and five (5) unexcused absence, will result in one letter grade lower. Your grade will be an automatic F if you have more than seven (7) unexcused absences. Makeup labs/exams will be permitted only if you had sought and received my approval prior to the absence which caused you to miss the related lab/exam. You will benefit most by way of understanding the content of the course by completing all the assignments in a timely manner. If you know in advance that you will be absent, please send me a dated letter or an email.

Grades:

100%-90% = A	69.9%-60% = D
89.9%-80% = B	59.9%-0% = F
79.9%-70% = C	

STATEMENT OF DISABILITY:

If you are registered with the Office of Services for Individuals with Disabilities, please make an appointment with the course instructor to discuss any academic accommodations you need. If you need academic accommodations and are not registered with the Office of Services for Individuals with Disabilities, please contact the office on the third floor of the Student Services Building, by email at disabilities@eku.edu or by telephone at (859) 622-2933 V/TDD. Upon individual request, this syllabus can be made available in alternative forms.

☺ The work you do in the laboratory, and the grade you earn, should reflect your personal abilities, and accomplishments. Individual homework and lab reports are required from each student. I encourage you to discuss your assignments with other students. However any work you submit must be your own.

☺ Any suggestions leading to improvements in the content or presentation of the course, especially in the laboratory work, are most welcome.