Springfield Technical Community College

ACADEMIC AFFAIRS

Course Number:	EET-135	Class/Lect Hours:	2	Lab Hours:	3	Credits:	3	Dept.:	ELEC.AS/ERC	B.COC	
Course Title:	PLCs I					Sem	ester:	Spring	Year:	2016	

Course Description, Prerequisite, Corequisite:

This course will introduce the student to the Programmable Logic Controller (PLC). PLCs are the heart of modern plant control in industrial automation. This course will begin with a basic description of the components of the PLC, present the various input/output devices used with modern PLCs while simultaneously learning how to program Allen-Bradly PLCs using LogixPro software & simulator. Upon completion of this course students will have a fundamental understanding of PLC programming, I/O connections and practical applications of the PLC environment.

Prerequisite: EET-105 & EET-110 or permission of instructor.

Corequisite: EET-135L.

Course Objectives	Competencies
1. Understand basic function of a PLC	a. Understand basic computer architecture. b. Know the basic parts of a PLC, I/O and Memory Maps. c. Know proper size of PLC for a specific application. d. Understand digital and analog I/O e. Understand XIO and XIC instructions and N.O. & N.C. switches. I. Understand Decimal, Binary, Hex & Octal number systems, g. Understand BCD, Gray & ASCII Codes and their applications. h. Understand scan cycle of PLC.
2. Understand fundamental digital logic and programming concepts.	a. Understand AND, OR, NAND, NOR, XOR, XNOR functions. b. Know relationship among truth table, logic function & logic

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	expression. c. Be able to implement logic functions using ladder logic, d. Create a functional PLC program from any of the following: Boolean Expression, Logic Gate Schematic. Truth Table or Ladder Diagram. e. Know differences between hard-wired logic and programmed logic. f. Know how to wire and program a seal-in circuit. g. Understand Word-Level Logic Instructions.
3. Understand common PLC Programming Instructions & Techniques	a. Know XIO & XIC implementations and avoid common mistakes. b. Know how to use an internal relay bit. c. Understand RUN and SINGLE STEP operation modes. d. Understand how to use LogixPro simulator to test PLC programs. e. Understand latching relays and the operation of latching PLC outputs.
4. Understand basic limit switch and sensor inputs.	a. Understand basic types of contact and limit switches. b. Understand operation of pressure, float, level & temperature switches. c. Understand operation of flow switches, velocity & position sensors. d. Understand concept of a proximity sensor. e. Understand operation of a capacitive sensor. f. Understand operation of an inductive sensor. g. Understand operation of through beam & diffuse beam optical sensors.
5. Understand the operation of PLC Timer instructions.	 a. Understand mechanical timers for ON-Delay and OFF-Delay. b. Understand both ON-Delay and OFF-Delay Timer PLC Instructions. c. Understand the operation of a Retentive Timer. d. Understand how to cascade times.
6. Understand the operation of PLC Counter instructions.	a. Understand the operation of UP-Counter instructions. b. Understand the operation of DOWN-Counter instructions. c. Understand how to cascade counters. d. Understand how to combine counters and timers.