10/3/2024 DATE

☑ REQUIRED COURSE
☑ ELECTIVE COURSE

TEC/BUS DIVISION

☐ NEW COURSE
☑ REVISION

Lake Land College

Course Information Form

COURSE NUMBER:	EET-086		**TITLE:** *(30 Characters Max)*	Prog Logic Controllers I							
SEM CR HRS:	2.0	**Lecture:**	1.0	**Lab:**	2.0	**ICCB Lab:**	2.0	**ECH:**	3.0		
Course Level:	☐ Gen Ed/IAI ☐ Baccalaureate/Non-IAI ☑ Career/Technical ☐ Dev Ed/Not in Degree Audit			**Clinical Practicum:**	0.0	**Work-based Learning:**	0.0	**WBL ECH:**	0.0		
COURSE PCS #	12 - 15.0613		**IAI Code**	N/A				**Contact Hours (Minutes/Week)**			
Repeatable (Y/N):	N	**Pass/Fail (Y/N):**	N	**Variable Credit (Y/N):**	N	**Min:**		**Max:**		**16 Wks**	150	**8 Wks**	300
Prerequisites:	EET-072 or instructor consent										
Corequisites:	None										
Catalog Description: (40 Word Limit)	This course covers basic PLC operation and programming, using Rslogix software and Allen Bradley PLCs. Topics include: basic ladder design, Input-Output, timers, counters, batch processes, shift registers, word compare, and math. (Meets SACA Automation Specialist I C-207 and C-208 credentials.)										

List the Major Course Segments (Units)	Contact Lecture Hours	Contact Lab Hours	Clinical Practicum	Work-based Learning
Standard 207.8 & 207.12 Program and operate a basic PLC logic program	4	4		
Standard 207.13 Program and operate a basic PLC sequence program	2	4		
Standard 207.12 Program and operate a basic PLC motor sequence program	2	4		
Standard 207.10 Program and operate a PLC logic program that uses comparison instructions	2	4		
Standard 207.11 Program and operate a PLC project that uses math instructions	2	4		
Standard 208.6 & 208.7 Program and operate a multi-step PLC sequence program	3	4		
Troubleshooting	1	8		
TOTAL	16	32	0	0

EVALUATION							
QUIZZES	☑	EXAMS	☐	ORAL PRES	☐	PAPERS	☐
LAB WORK	☑	PROJECTS	☑	COMP FINAL	☐	OTHER	☐

COURSE MATERIALS		
TITLE:	Instructor supplied	
AUTHOR:		
PUBLISHER:		
VOLUME/EDITION/URL:		
COPYRIGHT DATE:		

MAJOR COURSE SEGMENT	HOURS	LEARNING OUTCOMES
		The student will be able to:
Standard 207.8 & 207.12 Program and operate a basic PLC logic program	8	Performance Indicators: 1.Interpret a basic PLC ladder logic program. 2. Interpret a basic PLC I/O diagram. 3. Interpret a basic PLC power diagram. 4. Design and test a basic PLC ladder program. 5. Interpret the operation of PLC motor control sequence program. 6. Design and test operation of a PLC motor control sequence program. Knowledge Indicators: 1. Describe operation of a basic PLC logic instructions: normally-open, normally-closed, output coil, internal coils, timers and up/down counters. 2. Describe the symbolic, absolute discrete I/O address system. 3. Describe the operation of a seal-in logic program. 4. Describe the operation of a PLC-controlled motor control circuit. 5. Describe the operation of a reversing motor control.

Standard 207.13 Program and operate a basic PLC sequence program	6	Performance Indicators: 1. Interpret the operation of an event-driven 2-step PLC sequence program. 2. Interpret the operation of a time-driven 2-step PLC sequence program. 3. Design and test a basic event-driven PLC sequence program. 4. Design and test a time-driven PLC sequence program. Knowledge Indicators: 1. Describe the operation of an event-driven PLC sequence program. 2. Describe the operation of a time-driven PLC sequence program.
Standard 207.12 Program and operate a basic PLC motor sequence program	6	Performance Indicators: 1. Interpret the operation of PLC motor control sequence program. 2. Design and test operation of a PLC motor control sequence program. Knowledge Indicators: 1. Describe the operation of a seal-in logic program. 2. Describe the operation of a PLC-controlled motor control circuit. 3. Describe the operation of a reversing motor control.
Standard 207.10 Program and operate a PLC logic program that uses comparison instructions	6	Performance Indicators: 1. Interpret a PLC logic program that uses comparison instructions. 2. Enter and operate a PLC logic program that uses comparison instructions. 3. Interpret the operation of a PLC logic program that uses comparison instructions. Knowledge Indicators: 1. Describe the operation of PLC comparison instructions.
Standard 207.11 Program and operate a PLC project that uses math instructions	6	Performance Indicators: 1. Interpret a PLC logic program that uses basic math instructions: Add, Subtract, Divide and Multiply. 2. Enter and operate a PLC program that uses basic math instructions. 3. Interpret a PLC logic program that uses a Compute instruction. 4. Enter and operate a PLC program that uses a Compute instruction. 5. Design and test a PLC program that uses math instructions. Knowledge Indicators: 1. Describe operation and applications of basic PLC math instructions. 2. Describe operation and applications of PLC Compute instruction.
Standard 208.6 & 208.7 Program and operate a multi-step PLC sequence program	7	Performance Indicators: 1. Interpret the operation of a multi-step event-driven PLC sequence program. 2. Interpret the operation of a multi-step time-driven PLC sequence program. 3. Design and test a PLC multi-step PLC sequence program. 4. Troubleshoot a multi-step PLC sequence program with event-driven and time-driven steps. Knowledge Indicators: 1. Describe the operation of a multi-step event-driven and time-driven PLC sequence programs. 2. Describes types of PLC documentation: truth table, sequence of operation. 3. Describe how to interpret a multi-step PLC sequence program. 4. Describe how to troubleshoot a PLC sequence programs.

Troubleshooting	9	1. Identify the problems in various PLC program and correct them.
	48	

Outcomes*	At the successful completion of this course, students will be able to:
Course Outcome	Create an interlock properly.
Course Outcome	Create cascading timers properly.
Course Outcome	Use CTU, CTD timers and RES.
Course Outcome	Use of basic math function.
Course Outcome	Use of Word compare functions.
Course Outcome	Demonstrate the operation of a sequencer.
Primary Laker Learning Competency	Creative Thinking & Problem Solving: Students think creatively to solve problems.
Secondary Laker Learning Competency	Communication: Students communicate through the exchange of information.

**Course and program outcomes will be used in the software for outcomes assessment and should include at least 1 primary and 1 secondary Laker Learning Competency. Limit to 3-5.*