

**ELEC 53.12 Course Outline as of Fall 2017****CATALOG INFORMATION**

Dept and Nbr: ELEC 53.12 Title: PLC'S-MAINT TECHS-1

Full Title: Programmable Logic Controllers for Maintenance Technicians 1

Last Reviewed: 10/17/2011

Units		Course Hours per Week		Nbr of Weeks	Course Hours Total	
Maximum	2.00	Lecture Scheduled	2.00	17.5	Lecture Scheduled	35.00
Minimum	2.00	Lab Scheduled	0	6	Lab Scheduled	0
		Contact DHR	0		Contact DHR	0
		Contact Total	2.00		Contact Total	35.00
		Non-contact DHR	0		Non-contact DHR	0

Total Out of Class Hours: 70.00

Total Student Learning Hours: 105.00

Title 5 Category: AA Degree Applicable

Grading: Grade or P/NP

Repeatability: 00 - Two Repeats if Grade was D, F, NC, or NP

Also Listed As:

Formerly: ELEC299.41

**Catalog Description:**

Programmable Logic Controllers for the Maintenance Technician. Identification and troubleshooting of typical controller problems; beginning to intermediate ladder logic programming; essentials of working in an industrial environment.

**Prerequisites/Corequisites:****Recommended Preparation:****Limits on Enrollment:****Schedule of Classes Information:**

Description: Programmable Logic Controllers for the Maintenance Technician. Identification and troubleshooting of typical controller problems; beginning to intermediate ladder logic programming; essentials of working in an industrial environment. (Grade or P/NP)

Prerequisites/Corequisites:

Recommended:

Limits on Enrollment:

Transfer Credit:

Repeatability: Two Repeats if Grade was D, F, NC, or NP

## **ARTICULATION, MAJOR, and CERTIFICATION INFORMATION:**

<b>AS Degree:</b>	<b>Area</b>	Effective:	Inactive:
<b>CSU GE:</b>	<b>Transfer Area</b>	Effective:	Inactive:
<b>IGETC:</b>	<b>Transfer Area</b>	Effective:	Inactive:
<b>CSU Transfer:</b>		Effective:	Inactive:
<b>UC Transfer:</b>		Effective:	Inactive:

**CID:**

**Certificate/Major Applicable:**

Certificate Applicable Course

## **COURSE CONTENT**

### **Outcomes and Objectives:**

Upon completion of this course the student will be able to, at a beginning to intermediate level:

1. Design and set up software in a control system and make it work properly.
2. Interpret and apply safety procedures in a manufacturing environment.
3. Originate proper tagout procedures when working on electrical equipment.
4. Develop a PLC program using ladder logic.
5. Recognize and evaluate faults in sensors and output devices.
6. Evaluate and troubleshoot software problems.

### **Topics and Scope:**

1. Types of input devices
2. Types of output devices
3. Types of controllers
4. Types of software
5. Fundamentals of control programs
6. Basic instructions
7. Loading software and operating PLCs
8. Basic tag out procedures
9. Basic Manufacturing safety
10. Wiring, Direct Current (DC) inputs, Alternating Current (AC) inputs, Relay Outputs, Transistor outputs

### **Assignment:**

1. Textbook reading (15-30 pages per week)

2. Homework problem sets (3-5)
3. Design software that can be used to control outputs (1-2 designs)
3. Prepare 1-3 case studies of applications of PLCs to manufacturing environments
4. Midterm and final exam

### Methods of Evaluation/Basis of Grade:

**Writing:** Assessment tools that demonstrate writing skills and/or require students to select, organize and explain ideas in writing.

Case studies
--------------

Writing 5 - 30%
--------------------

**Problem Solving:** Assessment tools, other than exams, that demonstrate competence in computational or non-computational problem solving skills.

Homework problem sets and software designs
--

Problem solving 40 - 60%
-----------------------------

**Skill Demonstrations:** All skill-based and physical demonstrations used for assessment purposes including skill performance exams.

None
------

Skill Demonstrations 0 - 0%
--------------------------------

**Exams:** All forms of formal testing, other than skill performance exams.

Multiple choice, true/false, matching items, completion, short answer; mid-term and final
---

Exams 20 - 40%
-------------------

**Other:** Includes any assessment tools that do not logically fit into the above categories.

None
------

Other Category 0 - 0%
--------------------------

### Representative Textbooks and Materials:

Programmable Logic Controllers, 2/e, by Rabiee, copyright 2009, Goodheart-Willcox

Programmable Logic Controllers, 3/e, by Petruzella, copyright 2005 (classic text), McGraw-Hill, Inc.