ELEC 53.13 Course Outline as of Spring 2008

CATALOG INFORMATION

Dept and Nbr: ELEC 53.13   Title: PLC'S MAINT TECH 2
Full Title: Programmable Logic Controllers for Maintenance Technicians 2
Last Reviewed: 11/7/2011

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	8	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: ELEC299.42

Catalog Description:
Programmable Logic Controllers for the Maintenance Technician, advanced course. Advanced identification and troubleshooting of more difficult and typical controller problems, advanced intermediate to advanced ladder logic programming, learning pendants.

Prerequisites/Corequisites:
Course Completion or Current Enrollment in ELEC 53.12 (or ELEC299.41)

Recommended Preparation:

Limits on Enrollment:

Schedule of Classes Information:
Description: Programmable Logic Controllers for the Maintenance Technician, advanced course. Advanced identification and troubleshooting of more difficult and typical controller problems, advanced intermediate to advanced ladder logic programming, learning pendants. (Grade or P/NP)
Prerequisites/Corequisites: Course Completion or Current Enrollment in ELEC 53.12 (or ELEC299.41)

Recommended:
Limits on Enrollment:
Transfer Credit: CSU;
Repeatability: Two Repeats if Grade was D, F, NC, or NP

ARTICULATION, MAJOR, and CERTIFICATION INFORMATION:

AS Degree:	**Area**			Effective:	Inactive:
CSU GE:	**Transfer Area**			Effective:	Inactive:
IGETC:	**Transfer Area**			Effective:	Inactive:
CSU Transfer:	Transferable	Effective:	Spring 2004	Inactive:	Fall 2017
UC Transfer:		Effective:		Inactive:	

CID:

Certificate/Major Applicable:
Not Certificate/Major Applicable

COURSE CONTENT

Outcomes and Objectives:
Upon completion of the course the student will be able to:
1. Design ladder logic programs and assemble documentation.
2. Program and use touch screens and teaching pendants.
3. Compare and contrast 3 and 4 axis robot controllers.
4. Program a PLC (Programmable Logic Controller) using ladder logic and one additional PLC language.
5. Identify, troubleshoot, and repair faults in sensors and output devices.
6. Identify, troubleshoot, and resolve software problems.

Topics and Scope:

1. Fundamental operation of programmable logic controllers by assessing and evaluating analog inputs and outputs, latching instructions, counters, timers and timer accuracy.
2. Programmable logic controller output devices.
3. Advanced troubleshooting techniques of programmable logic controllers and related software.
4. Introduction to robotics.

Assignment:

1. Design ladder logic programs.
2. Modify ladder logic programs.
3. Assemble software documentation in two programming languages.
4. Compare and critique the function and benefits of 3 and 4 axis robotic controllers.

5. Identify and evaluate sensor and output faults connected to a PLC.
6. Evaluate and implement changes necessary to update software that operates a manufacturing process.
7. Write four 2-3 page case studies selecting and recommending correct sensors for a particular manufacturing process.
8. Four quizzes, 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 20 - 30%

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

Homework problems, Compare and critique robotic controllers.	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, Software writing and development	Exams 10 - 30%

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

None	Other Category 0 - 0%

Representative Textbooks and Materials:
Representative Texts:
Programmable Logic Controllers. Contributors: J. Lord, C. Salmons copyright 2007, Schoolcraft Publishing.