Faculty of Engineering & Technology

Programmable Logic Controllers(PLCS)

Information :

Course Code :	MKT 440	**Level :**	Undergraduate	**Course Hours :**	2.00- Hours

Department : Specialization of Mechatronics Engineering

Instructor Information :

Title	Name	Office hours
Lecturer	MOHAMED ABDELBAR SHAMSELDIN ALY	9
Teaching Assistant	Donia Waheed Mohamed Abdelmonem Saleem	

Area Of Study :

This course aims to:
ÅIntroduce the Programmable logic controllers (PLCs) as an industrial option for a microprocessor based control unit.
ÅIntroduce the necessary hardware and software for editing debugging, and executing a PLC control program.
ÅTrain students to design, build, and test a PLC program code for controlling an automated system.

Description :

Basic Programmable logic controllers (PLCs) functions and programming; Relay and ladder logic; PLC programming and interfacing; PLC installation practices and troubleshooting techniques; Strategies to identify and localize PLC hardware generated problems; PLC Safety Procedures; PLCs in mechatronics systems; Mini design projects.

Course outcomes :

a.Knowledge and Understanding: :	
1 -	a1. Describe the function of the main parts of a typical PLC.
2 -	a2. Describe the different types of PLC peripherals.
3 -	a3. Interpret the basic PLC programming instructions.
4 -	a4. Describe the main steps for commissioning, maintenance, and troubleshooting of a PLC controlled system.
b.Intellectual Skills: :	
1 -	b1. Develop PLC programs based on logic gate functions.
2 -	b2. Convert relay ladder schematics to ladder logic programs.
3 -	b3. Develop PLC programs directly from a narrative description.
4 -	b4. Apply combinations of counters and timers to PLC programs.
5 -	b5. Create PLC programs involving data manipulations, math and sequencer instructions.
c.Professional and Practical Skills: :	
1 -	c1. Install the PLC editor Software to a specific PC.
2 -	c2. Apply safety rules in preparing and execution of PLC control systems.
3 -	c3. Download the designed ladder logic program to the corresponding

4 -	c4. Present the results of Experiments of control using PLC.
d.General and Transferable Skills: :	
1 -	d1. Work in stressful environment and within constrain.
2 -	d2. Communicate effectively.
3 -	d3. Effectively manage tasks, time, and resources.
4 -	d4. Search for information and engage in life-long self-learning discipline

Course Topic And Contents :

Topic	No. of hours	Lecture	Tutorial / Practical
Introduction		2	0
PLC H.W. components		2	0
Basics of PLC Programming		2	0
Programming Timers		5	0
Programming Counters		5	0
Programming Control Instruction		3	1
Data Manipulation Instructions.		3	0
Math Instructions		2	0
Sequencer & Shift register Instruction		3	0
PLC Commissioning, maintenance, & Trouble shooting.		3	0
Labs- Project work.		0	15

Teaching And Learning Methodologies :

Interactive Lecturing
Problem solving
Discussion
Experiential learning
Project
Research

Course Assessment :

Methods of assessment	Relative weight %	Week No	Assess What
Assignments, Participation, & Quizzes	20.00	12	
FinalWrittenExam	40.00		
First MidTerm Exam	15.00	6	
Project	10.00	12	
Second Midterm Exam	15.00	9	

Recommended books :

ÅBolton, William; ñMechatronics: Electronic Control Systems in Mechanical and Electrical Engineeringò¸ Prentice Hall, 4th Edition, 2008