

PRINCE SATTAM BIN ABDULAZIZ UNIVERSITY
COLEGE OF ENGINEERING AT WADI ADDAWASER

Teaching Plan

Course Number and Name	EE3521 Automatic Control Systems Laboratory		
Contact Hours	3/week	Credit Hours	1
Prerequisites	EE3511	Semester & Year	
Required, Elective or Selective course:	R		
Instructor's/ Coordinators Name	Eng. Mohammed Alansi		

Course Description

In this course, the students learn how to use MATLAB to do a simulation of the open, closed loop system as well as PID controller. Practical aspects of control techniques are introduced where the students analyze the words transient & steady state performance of a system; study how to design a PID Controller for electrical systems such as temperature, DC motor and Servo position. Then, they deal with the PLC Hardware and Software and types of PLC programming Techniques. Then, they writ PLC programs to control of some applications for PLC.

References

Franklin GF, Powell JD and Workman ML, "Digital Control of Dynamic Systems", Addison Wesley, Last Edition.

Class Schedule

Lecture:	0 units	(0 hours X 15 weeks)
Tutorial:	0unit	(0hours X 15weeks)
Laboratory:	3 unit	(3 hours X 15 weeks)

Course Outcomes

CO1	Apply the knowledge gained form the control engineering courses.
CO2	Analyze and understand the Transient & Steady State Performance of a system in terms of speed, overshoot, time delay, time constant and stability.
CO3	Design a PID controller in order to improve the system performance.
CO4	Understand the Programmable Logic Controller (PLC) system and write programs to control other electrical devices.

Assesment Method

Assessment	CO1	CO2	CO3	CO4	Distribution
Quizzes & Assignments	√	√	√	√	3 %
Mini-Project	√	√	√	√	2%
Reports	√	√	√	√	10%
Test 1	√	√			20 %
Test 2			√	√	20%
Attendance					5%
Final Exam	√	√	√	√	40 %
Total					100%

RELATIONSHIP TO PROGRAM OUTCOMES

No.	Course Outcomes	Program Outcomes											
		1	2	3	4	5	6	7	8	9	10	11	12
CO1	Apply the knowledge gained form the control engineering courses.	√											
CO2	Analyze the Transient & Steady State Performance of a system in terms of speed, overshoot, time and stability.		√			√							
CO3	Design a PID controller in order to improve the system performance.	√	√	√								√	
CO4	Understand the Programmable Logic Controller (PLC) system and write programs to control other electrical devices.		√	√								√	
Course Outcome Analysis													

Topics to be Covered

Week	Topics	Deliver y	Assessment
1	Introduction Performance of First Order Systems.	Lab	Quiz./Assignment/Report/Test1/ Final Exam
2	Performance of Second Order Systems	Lab	Quiz./Assignment/Report/Test1/ Final Exam
3	PID Controller	Lab	Quiz./Assignment/Report/Test1/ Final Exam
5	Temperature Control Process (Static and Transient Performance)	Lab	Quiz./Assignment/Report/Test1/ Final Exam
6	Mid Exam 1		----
7	Temperature Control Process- Proportional Controller	Lab	Quiz./Assignment/Report/Test2/ Final Exam
8	DC Motor Speed Control- Static and Transient Performance	Lab	Quiz./Assignment/Report/Test2/ Final Exam
9	DC Motor Speed Control- PID Controller	Lab	Quiz./Assignment/Report/Test2/ Final Exam
10	Servo Motor Position Control with PID Controller	Lab	Quiz./Assignment/Report/Test2/ Final Exam
11	Mid Exam 2		----
12	PLC Hardware and Software	Lab	Quiz./Assignment/Report/ Final Exam
13	PLC programming Techniques	Lab	Quiz./Assignment/Report/ Final Exam
14	Control of Conveyor System using PLC	Lab	Quiz./Assignment/Report/ Final Exam
15	Final Exam		----

Prepared by:	Checked by:	Approved by:
Name: Eng. Mohammed Alansi Position: Lecturer Date: 13 November 2015	Name: Dr. Omer Mohammed Abdullah Position: Head of Electrical Engineering Program Date: 13 November 2015	Name: Dr. Mujahed Mohamed Position: Dean Date: 13 November 2015