

<b>Department of Industrial Engineering</b>			
<b>Automatic Control Lab. (65540)</b>			
<b>Total Credits</b>	<b>1</b>		
<b>major compulsory</b>			
<b>Prerequisites</b>	P1 : Control Systems (65461)		
<b>Course Contents</b>			
1) Control circuit using contactors 2) Basic Electrically-Controlled Pneumatic Circuits 3) PLC-programming 4) open loop and closed loop system			
<b>Intended Learning Outcomes (ILO's)</b>		<b>Student Outcomes (SO's)</b>	<b>Contribution</b>
1	An ability to apply knowledge of different usage of contactors in the three phase systems, and Pneumatics Trainer, to identify the various system components, timers and Counters in pneumatics circuits and Control circuit using contactors	A	40 %
2	An ability to use useful techniques of circuits using the types of controllers, and to study the deferent types of controllers, P, PI, PD, and to be able to build Star-Delta Starter, and to design speed Control of three Phase Asynchronous Motor and PLC-pr	C	40 %
3	An ability to design different circuits of the three phase system, and some PLC programs.	B	20 %
<b>Textbook and/ or References</b>			
Control Lab Manual			
<b>Assessment Criteria</b>		<b>Percent (%)</b>	
Reports		50 %	
Laboratory Work		25 %	
Final Exam		25 %	
<b>Course Plan</b>			
<b>Week</b>	<b>Topic</b>		
1	Introduction to control lab		
2	Control circuit using contactors		
3	Introduction to pneumatic systems		
4	Introduction to PLC as programmable device		
5	Introduction to controller system.		
6	Motor control to investigate delay-on auxiliary contactor and time relay, And to investigate motor reversing control circuits.		
7	To describe the function and operation of magnetic proximity switches, and to describe the function and operation of quick exhaust valves, and to introduce indirect control using solenoid-operated directional valves		
8	MIDTERM EXAM 1		
9	To use the set-rest operation on PLC, and to understand the timer operation on PLC.		
10	open loop and closed loop system		
11	To investigate star -delta starter, and to control the speed of three phase Asynchronous Motor.		
12	To describe the operation of a time-delay relay, and to introduce time-delays		
13	To understand the counter up and counter down operation on PLC.		