

**IE 337: Automatic Control Systems****3(3,1,1)**

<b>Catalog Data</b>	Process control fundamentals using programmable logic controller	
<b>Prerequisite</b>		
<b>Co requisite</b>		
<b>Level</b>	6	
<b>Textbook</b>	* Modern Control Systems, R.C. Dorf, Addison Wesley. * Logical Design of Automation System, Sunder B. Friedman, Prentice Hall.	
<b>Reference</b>	*Automatic Control Systems, B.C. Kuo, Prentice-Hall, Inc. *PC-Based Instrumentation and Control, Mike Tooley, Newnes, An Imprint of Butterworth-Heinemann Ltd. (1991). *Manufacturing Automation Using PLC, Ali M Alsamhan, Saied M Darwish, Grant 16/424 of Research center College of Engineering, King Saud University *David W. Pessen, Industrial Automation, Circuit Design & Components” , A Wiley-Interscience Publication, John Wiley & Sons, 1989.	
<b>Learning Objectives</b>		
<b>Topics (classes)</b>	1. Introduction to factory automation.	4 classes
	2. Programmable logic controller and relay ladder logic	4 classes
	3. Numbering systems	2classes
	4. Fundamental of computer logics.	4 classes
	5. Logic sensors and actuators	4 classes
	6. Pneumatic, sensors, actuators and control methods	5 classes
	7. Relay ladder logic design of common machine sequence	8 classes
	8. PLC timer, counter, registers and analog input outputs	9 classes
	9. Illustrated industrial automation applications	5 classes
	<b>Total Classes</b>	<b>45 classes</b>
<b>Lab. work</b>	1 Logic gate networks using Programmable logic controller	3 Lab
	2 Electric proximity sensors and actuators.	1 Lab
	3 Pneumatic actuators, sensors and logic network	1 Lab
	4 Relay ladder logic of common control sequence	3 Lab
	5 Timer, counter, analog input /outputs	3 Lab
<b>Computer Usage</b>	Programmable of logic controller using relay ladder logic.	
<b>Learning outcomes</b>	1. Fundamentals of manufacturing automations	
	2. Linear and digital control systems.	
	3. Relay ladder logic development for different control problems.[c]	
	4. Planning and design machine automation using PLC [c]	
	5. Experimental Automation Using PLC [b]	
<b>Estimated Category Content</b>	Engineering Science: 2 credit hours (60%) Engineering Design: 1 credit hour (40%) 20 Marks 1 <sup>st</sup> midterm examination + 20 Marks 2 <sup>nd</sup> Midterm examination , 10 Marks Lab work + 10 Marks Lab examination	
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<b>Preparation Date</b>	January 2014	