


Sub.	Course Description – توصيف مقرر دراسي	الموضوع	 كليات المعرفة ALMAAREFA COLLEGES
Date		التاريخ	

Course Code & No	IE345		رقم المقرر ورمزه
Course Name	Industrial Control System and Automation		اسم المقرر
Credit Hours	4 (3+1+2)		عدد الساعات المعتمدة
Pre-requisite	PHYS 202, COMP 201		المتطلب السابق

General Description	توصيف عام
<p>Process control fundamentals; Control theory principles; Modeling analogy; Digital control using programmable logic controller and computer. Industrial Automation and applications.</p>	

Course Objectives	أهداف المقرر
<p>The course familiarizes students with basic concepts and technologies of process control and automation systems.</p> <p>By the end of the course, each student should be able To</p> <ul style="list-style-type: none"> • Recognize the control process for factory automation • Recognize the process control techniques and control components • Design control system for operating industrial systems • Calculate and analyze control process performance and system stability • Design and develop programmable logic controller 	

Course Outlines	مفردات المقرر
<ul style="list-style-type: none"> • Part 1: Fundamentals of control theory and process control <ul style="list-style-type: none"> ○ System identification and modeling analogy ○ Synthesis of controllers ○ Performance analysis • Part 2 : Industrial automation and applications <ul style="list-style-type: none"> ○ Introduction to factory automation. ○ a) Electric sensors and actuators ○ Types of electric sensors and actuators ○ DC motor modeling, control and performance analysis ○ b) Pneumatic/Hydraulic sensors and actuators ○ Valves and actuators ○ Design of pneumatic/hydraulic control networks 	

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- Part 3 : Programmable logic controller
 - Programmable logic controller and relay ladder logic
 - Numbering systems and Fundamental of computer logics.
 - Relay ladder logic design of common machine sequence
 - PLC timer, counter, registers and analog input outputs
 - Illustrated industrial automation applications

References	المراجع
<p>Required Textbooks</p> <ul style="list-style-type: none"> • Modern Control Systems, 12th edition, Richard C. Dorf, Robert H. Bishop, Addison Wesley. • Logical Design of Automation System, Sunder B. Friedman, Prentice Hall, latest edition <p>Essential References Materials</p> <ul style="list-style-type: none"> • Manufacturing Automation Using PLC, Ali M Alsamhan, Saied M Darwish, Grant 16/424 of Research Center, College of Engineering, King Saud University • Automatic Control Systems, B.C. Kuo, Prentice-Hall, Inc. • PC-Based Instrumentation and Control, Mike Tooley, Newnes, An Imprint of Butterworth-Heinemann Ltd. (1991). • David W. Pessen, Industrial Automation, Circuit Design & Components”, A Wiley-Interscience Publication, John Wiley & Sons, 1989. • Applied Industrial Control, G.S. Madan, J.P.Elloy, R.Mezencev, N.Munro • Modern Control Engineering (4th edition) by K. Ogata, 2002. 	