The University of Jordan
School of Engineering
Industrial Engineering Department
Summer Semester 2023/2024

Course name:	Automation and Automatic Control Lab
Course code:	IE0906544
Credits hours	1
Contact hours/room:	Section 1: Sunday 1:30-3:30 Section 2: Tuesday 1:30-3:30
Course instructor's name, Email, and phone:	Dr. Baha'eddin Alhaj hasan b.alhajhasan@ju.edu.jo 22936
Text book:	Lab Manual
Other reference(s):	Automation, production systems and computer integrated manufacturing Mikell P. Groover Pearson, 4rth, 2015. Programmable Logic Controllers, 5th Edition, 2017 Frank D. Petruzella
Course Description:	The Industrial Automation and Control Lab is a practical, hands-on course designed to provide students with a comprehensive understanding of automation and control systems commonly used in industrial settings. The course emphasizes the application of theoretical concepts learned in related coursework through the use of real-world industrial automation equipment and software.
Providing Department:	Industrial Engineering
Prerequisite Course:	**Prerequisite:** Industrial Automation IE0906542
Course type	**Compulsory**

Assessment Methods:

Method	Weight %
Lab works (quizzes + data sheets + participation)	20%
Mid Exam	30 (theory 20%, practical 10%)
Final Exam	50 (theory 40%, practical 10%)

Course Learning Outcomes:	#	**After successful completion of this course, the student will be able to**	
	CLO1	The primary aim of the lab is to offer students practical experience in working with industrial automation and control systems	
	CLO2	Basic concepts of control technology: systems characteristics, PID controller by using MATLAB.	
	CLO3	The course aims to develop students' skills in integrating various components of industrial automation systems. This includes sensors, actuators, programmable logic controllers (PLCs)	
	CLO4	Students will learn programming CNC machines by using G and M code programming. Automation, such as ladder logic for PLCs.	

The B.Sc. in industrial Engineering program enables students to achieve, by the time of graduation the following program learning outcome (SOs)			
a	*An ability to apply knowledge of mathematics, science and engineering.*	*g*	*An ability to communicate effectively.*
b	*An ability to design and conduct experiments, as well as to analyze and interpret data.*	*h*	*An ability to understand the impact of engineering solutions in a global, economic, environmental and societal context.*
c	*An ability to design a system, component, or process to meet desired needs within realistic constraints.*	*i*	*An ability to engage in life-long learning.*
d	*An ability to function productively as part of multidisciplinary teams and show leadership qualities.*	*j*	*An ability to acknowledge contemporary issues related to the discipline.*

e	*An ability to identify, formulate and solve engineering problems.*		
f	*An ability to understand professional and ethical responsibilities.*	*k*	*An ability to use techniques, skills and modern engineering tools necessary for engineering practice.*

	Week #	**Topic**
Brief list of topics	2	Syllabus
	3	Experiment 1: Introduction to MATLAB / SIMULINK
	4	Experiment 2: First Order Systems
	5	Experiment 3: Second Order Systems
	6	Experiment 4: PID Controller
	7	Practical Midterm
	8	Experiment 5: Pneumatic Actuators (1)
	9	Experiment 6: Pneumatic Actuators (2)
	10	Experiment 7: PLC Programming (1)
	11	Experiment 7: PLC Programming (2)
	12	Practical Final
	13	Lab Final
	14	
Important Notes:	• Do not hesitate to ask questions • You are required to bring a notebook and take notes in classes. • Students are expected to attend every class session and they are responsible for all material, announcements, schedule changes, etc., discussed in class. • Discuss the assignments among yourselves • Don't Cheat; direct copying of others work will NOT be allowed or tolerated and will result in a reduction of grade. If you are found to be cheating in any way, on an exam or assignment, even signing the roll sheet for another student, you will be given an "F" for the course. There will be no exceptions. • All cases of academic dishonesty will be handled in accordance with university policies and regulations. JU policy requires the faculty member to assign ZERO grade (F) if a student misses 15% of the classes that are not excused, and 20% of the classes that are excused • Students are expected to be ready to take a quiz any time they have a class. There will be no make-up quizzes or home works. • Any students with disabilities who need accommodations in this course are encouraged to speak with the instructor as soon as possible to make appropriate arrangements for these accommodations.	