The University of Jordan
School of Engineering
Industrial Engineering Department
Second Semester 2024/2025

Course name:	Industrial Automation
Course code:	IE0906542
Credits hours	2
Contact hours/room:	Section 1:12:30-01:30 Mechanical 101 Section 2: 11:30-12:30 Industrial 103
Course instructor's name, Email, and phone:	Dr. Baha'eddin Alhaj hasan b.alhajhasan@ju.edu.jo 22936
Textbook:	Automation, production systems and computer integrated manufacturing Mikell P. Groover Pearson, 4rth, 2015.
Other reference(s):	Programmable Logic Controllers, 5th Edition, 2017 Frank D. Petruzella
Course Description:	1. Introduction to the basic automation concepts. 2. Introduction to hardware components of the control loop: sensors, actuators, drivers, signal conditioning circuits, and controllers. 3. Introduction to logic design includes combinational logic circuits. 4. Introduction to Programmable Logic Controllers (PLC) programming using ladder diagrams. This includes timers, counters, and analog blocks; design approaches based on Boolean and structured logic, state machines, and flowcharts. 5. Introduction to CNC programming. 6. Introduction to production concepts, serial production lines, assembly systems, and types of automation.
Providing Department:	Industrial Engineering
Prerequisite Course:	**Prerequisite:** Production planning and control, 0906421
Course type	**Compulsory**

Assessment Methods:

Method	Weight %
First Exam	30
Quizzes, participation and projects	20
Final Exam	50

Course Learning Outcomes:	#	**After successful completion of this course, the student will be able to** Design basic control loop with all its components based on understanding
	CLO1	Various types of sensors, actuators and basic electronics.
	CLO2	Program of Programmable Logic Controller (PLC) using ladder diagrams.
	CLO3	Program of CNC machines using G & M code.
	CLO4	Understanding the basic operational concepts of production lines.

	Week #	**Topic**
A brief list of topics	1	Introduction to Automation
	2 -6	Introduction to Industrial Data Acquisition Systems
	7 - 10	Introduction to Programmable Logic Controllers (PLC)
	8 - 11	Introduction to CNC programming
	12 - 15	Basic production concepts, analysis of serial production lines, assembly lines.
	16	Final Exam
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.	

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.*