



**The University of Jordan**  
**School of Engineering**  
**Industrial Engineering Department**  
**2<sup>nd</sup> semester 2020/2021**

<b>Course name:</b>	Automation		
<b>Course code:</b>	IE0906542		
<b>Credits hours</b>	2+1		
<b>Contact hours/room:</b>	Section 1 :9:30-10:30 S T middle auditorium Section 2: 9:00-10:00 M W. middle auditorium		
<b>Course instructor's name, Email, and phone:</b>	Prof. Mahmoud Barghash,		
	<a href="mailto:mabargha@ju.edu.jo">mabargha@ju.edu.jo</a>		
	22936		
<b>Course Coordinator:</b>	Prof. Mahmoud Barghash		
<b>Text book:</b>	Automation, production systems and computer integrated manufacturing Mikell P. Groover Pearson, 4 <sup>th</sup> , 2015, Programmable Logic Controllers, 2 <sup>nd</sup> Edition James A. Rehg, Pennsylvania State University Glenn J. Sartori 2009 Pearson		
<b>Other reference(s):</b>			
<b>Course Description:</b>	<b>2014/2015 Course Catalogue Description</b> Basic production concepts, analysis of serial production lines, assembly line balancing, computer numerical control, industrial robots, automated material handling systems, automated storage and retrieval systems. Lab experiments concentrate on familiarizing the student with the concepts studied in class and on PLC programming and applications.		
<b>Providing Department:</b>	Industrial Engineering		
<b>Prerequisite Course:</b>	<b>Prerequisite:</b> Production planning and control, 0906421		
<b>Course type</b>	<b>Compulsory</b>		
<b>Assessment Methods:</b>	<b>Method</b>	<b>Weight %</b>	<b>Date</b>
	Lab course work	<b>10</b>	
	Mid Exam course + lab	<b>30</b>	
	Projects + homework's	10	
	Final Exam Course lab + course	<b>50</b>	
<b>Course Learning Outcomes:</b>	#	<b>After successful completion of this course, the student will be able to</b>	<b>SO</b>
	<b>CLO1</b>	To be able to read machines electrical ladder diagrams including pneumatic sensors and pneumatic circuits	2
	<b>CLO2</b>	To be able to do basic capacity analysis for the automation systems	4

	<b>CLO3</b>	To be able to write simple CNC G-code programming	2
	<b>CLO4</b>	To be able to express automation requirements into electrical and pneumatic circuits and PLC ladder logic To understand line balancing problems and be able to apply it	2

<b>Brief list of topics</b>	<b>Week #</b>	<b>Topic</b>
	1-2	Introduction to programmable logic controllers
	4-5	Input devices and output actuators (including pneumatics)
	7	Practical programmable logic controllers (LOGO)
	8-9	Computer numerical control (G-code) Industrial Robotics
	10-13	Automated material handling systems, automated storage and retrieval systems.
	14-end of semester	Basic production concepts, analysis of serial production lines, assembly line balancing

<b>Important Notes:</b>	<ul style="list-style-type: none"> <li>Do not hesitate to ask questions</li> <li>You are required to bring a notebook and take notes in classes.</li> <li>Students are expected to attend every class session and they are responsible for all material, announcements, schedule changes, etc., discussed in class.</li> <li>Discuss the assignments among yourselves</li> <li>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</li> </ul>
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	<p>another student, you will be given an "F" for the course. There will be no exceptions.</p> <ul style="list-style-type: none"> <li>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</li> <li>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.</li> </ul>
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***The B.Sc. in industrial Engineering program enables students to achieve, by the time of graduation the following program learning outcome (SOs)***

<b>1</b>	an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics	<b>5</b>	<i>an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives</i>
<b>2</b>	an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors	<b>6</b>	<i>an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions</i>
<b>3</b>	<i>an ability to communicate effectively with a range of audiences</i>	<b>7</b>	<i>an ability to acquire and apply new knowledge as needed, using appropriate learning strategies..</i>
<b>4</b>	<i>an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts</i>		

