



## Course Syllabus

1	<b>Course title</b>	Automation and Programmable Logic Controller	
2	<b>Course number</b>	0938461	
3	<b>Credit hours</b>	3	
	<b>Contact hours (theory, practical)</b>	3 theoretical hours	
4	<b>Prerequisites/corequisites</b>	Automatic Control Systems (0908353)	
5	<b>Program title</b>	B.Sc. in Mechatronics Engineering	
6	<b>Program code</b>	0908461	
7	<b>Awarding institution</b>	The University of Jordan	
8	<b>School</b>	School of Engineering	
9	<b>Department</b>	Mechatronics Engineering Department	
10	<b>Course level</b>	Fourth Year	
11	<b>Year of study and semester (s)</b>	2022/2023 First semester	
12	<b>Other department (s) involved in teaching the course</b>	None	
13	<b>Main teaching language</b>	English	
14	<b>Delivery method</b>	<input checked="" type="checkbox"/> Face to face learning <input type="checkbox"/> Blended <input type="checkbox"/> Fully online	
15	<b>Online platforms(s)</b>	<input checked="" type="checkbox"/> Moodle <input type="checkbox"/> Microsoft Teams <input type="checkbox"/> Skype <input type="checkbox"/> Zoom <input type="checkbox"/> Others.....	
16	<b>Issuing/Revision Date</b>	6/10/2022	

### 17 Course Coordinator:

Name: Dr. Musa AlYaman	Contact hours: Sunday 9:30-10:30, Monday 9:30-10:00
Office number: 202 Mechatronics Engineering Department	Phone number: : 5355000 Ext. 23032
Email: <a href="mailto:m.alyaman@ju.edu.jo">m.alyaman@ju.edu.jo</a>	



### 18 Other instructors:

None

### 19 Course Description:

Introduction to Automation, Programmable Logic Controllers (PLC), PLC hardware, PLC software, SCADA Systems and Computer Numerical Control (CNC). CNC hardware, CNC software, Lab experiments concentrate on familiarizing the student with the concepts studied in class especially CNC and PLC programming and applications.

### 20 Course aims and outcomes:

#### A- Aims:

The course motivates the student to recognize the concept of automation, identify the benefits and requirements of automation, the knowledge in the Programmable Logic Controllers (PLC), and SCADA systems and the knowledge in the Computer Numerical Control

#### B- Students Learning Outcomes (SLOs):

Upon successful completion of this course, students will be able to:

SLOs	SLO (1)	SLO (2)	SLO (3)	SLO (4)	SLO (5)	SLO (6)	SLO (7)
SLOs of the course							
1. Identify the benefits and requirements of automation				X			
2. Recognize the different types of PLCs by visiting different factories				X			
3. Identify the strategies of SCADA and HMI systems and CNC.				X			
4. Practice the oral communication skills in a form of presentation and the written communication skills in a form of report				X			



## 21. Topic Outline and Schedule:

Week	Lecture	Topic	Student Learning Outcome	Learning Methods (Face to Face/Blended/ Fully Online)	Platform	Synchronous / Asynchronous Lecturing	Evaluation Methods	Day/Date
1	1.1	Course Overview	4	Face to Face		Synchronous		Sunday 9/10/2022
	1.2	Course Overview	4	Face to Face		Synchronous		Tuesday 11/10/2022
	1.3	Chapter 1 (Introduction to Automation)  Slides (1-14)	4	Face to Face	Ch1_Lec1	Synchronous		Thursday 13/10/2022
2	2.1	Chapter 2 PLC  Slides (1-11)	4	Face to Face	Ch2_Lec1	Synchronous		Sunday 16/10/2022
	2.2	Chapter 2 PLC  Slides (12-20)	4	Face to Face	Ch2_Lec2	Synchronous		Tuesday 18/10/2022
	2.3	Chapter 2 PLC  Slides (20-30)	4	Face to Face	Ch2_Lec3	Synchronous		Thursday 20/10/2022
Week	Lecture	Topic	Student Learning Outcome	Learning Methods (Face to Face/Blended/ Fully Online)	Platform	Synchronous / Asynchronous Lecturing	Evaluation Methods	Day/Date
3	3.1	Chapter 3 Basic Instructions 1  Slides (1-6)	4	Face to Face	Ch3_Lec1	Synchronous		Sunday 23/10/2022
	3.2	Chapter 3 Basic Instructions 1  Slides (6-9)	4	Face to Face	Ch3_Lec2	Synchronous		Tuesday 25/10/2022
	3.3	Chapter 3 Basic Instructions 1  Slides (9-17)	4	Face to Face	Ch3_Lec3	Synchronous		Thursday 27/10/2022

4	4.1	Chapter 3 Basic Instructions 1 <i>Slides (15-18)</i>	4	Face to Face	Ch3_Lec4	Synchronous	Sunday 30/10/2022
	4.2	Chapter 3 Basic Instructions 1 <i>Slides (19-23)</i>	4	Face to Face	Ch3_Lec5	Synchronous	Tuesday 1/11/2022
	4.3	Chapter 3 Basic Instructions 1 <i>Slides (19-23)</i>	4	Face to Face	Ch3_Lec6	Synchronous	Thursday 3/11/2022
5	5.1	Chapter 4 Basic Instructions 2 <i>Slides (1-10)</i>	4	Face to Face	Ch4_Lec1	Synchronous	Sunday 6/11/2022
	5.2	Chapter 4 Basic Instructions 2 <i>Slides (11-14)</i>	4	Face to Face	Ch4_Lec2	Synchronous	Tuesday 8/11/2022
	5.3	Chapter 4 Basic Instructions 2 <i>Slides (15-19)</i>	4	Face to Face	Ch4_Lec3	Synchronous	Thursday 10/11/2022
6	6.1	Chapter 4 Basic Instructions 2 <i>Slides (20-28)</i>	4	Face to Face	Ch4_Lec4	Synchronous	Sunday 13/11/2022
	6.2	Chapter 4 Basic Instructions 2 <i>Slides (29-34)</i>	4	Face to Face	Ch4_Lec5	Synchronous	Tuesday 15/11/2022
	6.3	Chapter 5 Comparison Instructions <i>Slides (1-11)</i>	4	Face to Face	Ch5_Lec1	Synchronous	Thursday 17/11/2022
7	7.1	Chapter 5 Comparison Instructions	4	Face to Face	Ch5_Lec2	Synchronous	Sunday 20/11/2022

		Slides (11-14)						
	7.2	Chapter 6 Control Instructions Slides (1-7)	4	Face to Face	Ch6_Lec1	Synchronous		Tuesday 22/11/2022
	7.3	Mid Review Chapters (1-5)	4	Face to Face		Synchronous		Thursday 24/11/2022
8	8.1	Mid Exam Chapters (1-5)	4	Face to Face		Synchronous	Mid Exam 10:30-11:30	Sunday 27/11/2022
	8.2	Mid Discussion	4	Face to Face		Synchronous		Tuesday 29/11/2022
	8.3	Chapter 6 Control Instructions Slides (8-12)	4	Face to Face	Ch6_Lec2	Synchronous	Project Available: 13:30	Thursday 1/12/2022
9	9.1	Chapter 6 Control Instructions Slides (13-15)	4	Face to Face	Ch6_Lec3	Synchronous		Sunday 4/12/2022
	9.2	Chapter 6 Control Instructions Slides (15-16)	4	Face to Face	Ch6_Lec4	Synchronous		Tuesday 6/12/2022
	9.3	Chapter 6 Control Instructions Slides (17-21)	4	Face to Face	Ch6_Lec5	Synchronous	Group Names Submission Due:13:30	Thursday 8/12/2022
Week	Lecture	Topic	Student Learning Outcome	Learning Methods (Face to Face/Blended/ Fully Online)	Platform	Synchronous / Asynchronous Lecturing	Evaluation Methods	Day/Date
10	10.1	Chapter 7 SCADA Slides (1-12)	4	Face to Face	Ch7_Lec1	Synchronous		Sunday 11/12/2022

	10.2	Chapter 7 SCADA Slides (13-22)	4	Face to Face	Ch7_Lec2	Synchronous		Tuesday 13/12/2022
	10.3	Chapter 7 SCADA Slides (23-32)	4	Face to Face	Ch7_Lec3	Synchronous	Factory Names Submission Due:13:30	Thursday 15/12/2022
	11.1	Chapter 7 SCADA Slides (33-40)	4	Face to Face	Ch7_Lec4	Synchronous		Sunday 18/12/2022
11	11.2	Chapter 8 CNC Slides (1-13)	4	Face to Face	Ch8_Lec1	Synchronous		Tuesday 20/12/2022
	11.3	Chapter 8 CNC Slides (14-28)	4	Face to Face	Ch8_Lec2	Synchronous	Project Due:13:30	Thursday 22/12/2022
12	12.1	Holiday						Sunday 25/12/2022
	12.2	Chapter 8 CNC Slides (29-32)	4	Face to Face	Ch9_Lec1	Synchronous		Tuesday 27/12/2022
	12.3	Chapter 9 HMI Slides (1-9)	4	Face to Face	Ch9_Lec2	Synchronous		Thursday 29/12/2022
13	13.1	Holiday						Sunday 1/1/2023
	13.2	Chapter 9 HMI Slides (10-15)	4	Face to Face	Ch9_Lec2	Synchronous		Tuesday 3/1/2023
	13.3	Project Discussion	4	Face to Face		Synchronous	G1+G2	Thursday 5/1/2023
14	14.1	Project Discussion	4	Face to Face		Synchronous	G3+G4	Sunday 8/1/2023

	14.2	Project Discussion	4	Face to Face		Synchronous	G5+G6	Tuesday 10/1/2023
	14.3	Project Quiz	4	Face to Face		Synchronous		Thursday 12/1/2023
15	15.1	Marks Discussion	4	Face to Face		Synchronous		Sunday 15/1/2023
	15.2	Course Discussion	4	Face to Face		Synchronous		Tuesday 17/1/2023
	15.3							Thursday 19/1/2023

### 22 Evaluation Methods:

Opportunities to demonstrate achievement of the SLOs are provided through the following assessment methods and requirements:

Evaluation Activity	Mark	Topic(s)	SLOs	Period (Week)	Platform
Quizzes	10				Moodle
Project	15		4	11 <sup>th</sup> week	Moodle
Midterm Exam	25	Chapters 1-5	4	8 <sup>th</sup> week	Moodle
Final Exam	50	All topics	4		Moodle

### 23 Course Requirements

**Each student should have a computer (with MS Project, MS Excel, and MS Word installed) and internet connection.**

### 24 Course Policies:

#### A- Attendance policies:

Students are expected to attend EVERY CLASS SESSION and they are responsible for all materials, announcements, schedule changes, etc., discussed in class

#### B- Absences from exams and submitting assignments on time:

There will be no make-up exams for any exam or missed assignment, which will be taken during the course. Exceptions to this rule is restricted only to the following cases:

- Death of only first order relatives (father, mother, sister, or brother).



- Hospital entry (inpatient) during the time of the examination.

Any other cases will be given the zero mark in the corresponding exam or assignment.

### **C- Health and safety procedures:**

Students are responsible for:

- Keeping themselves informed of conditions affecting their health and safety;
- Participating in safety training programs;
- Following to health and safety practices in their workplace, classroom;
- Advising of or reporting unsafe practices or serious hazards in the classroom or laboratory.

### **D- Honesty policy regarding cheating, plagiarism, misbehavior:**

Follow the UoJ guidelines that providing definitions, procedures, and recommendations for promotion and violation of academic honesty and integrity.

### **E- Grading policy:**

Follow the UoJ guidelines that providing definitions of undergraduate grading policy

### **F- Available university services that support achievement in the course:**

Text book, class handouts, and an access to Personal Computer with office software

## **25 References:**

### **A- Required book(s), assigned reading and audio-visuals:**

Industrial Automation: Hands On, Frank Lamb , Publisher McGraw-Hill Professional; 1 edition 2013  
ISBN-13: 978-0071816458

### **B- Recommended books, materials, and media:**

- Automation, Production Systems, and Computer Integrated Manufacturing, Mikell P. Groover, Printice Hall, 2008, 3rd Edition. ISBN-13: 978- 0132393218
- Modern Control Engineering, Katsuhiko Ogata, 5th Edition n, Prentice Hall.

## **26 Additional information:**





Name of Course Coordinator: Dr. Musa AlYaman-----Signature: ----- Date: 6/10/2022

Head of Curriculum Committee/Department: ----- Signature: ----- ---
Head of Department: ----- Signature: ----- -
Head of Curriculum Committee/Faculty: ----- Signature: ----- -
Dean: ----- Signature: -----