مركز الاعتماد وضمان الجودة
ACCREDITATION & QUALITY ASSURANCE CENTER

Course Syllabus

1	**Course title**	Automation
2	**Course number**	0906542
3	**Credit hours**	2+1
	Contact hours (theory, practical)	2 theoretical hours , 3 practical
4	**Prerequisites/corequisites**	Production planning and control (0906421)
5	**Program title**	B.Sc. in Industrial Engineering
6	**Program code**	0906542
7	**Awarding institution**	The University of Jordan
8	**School**	School of Engineering
9	**Department**	Industrial Engineering Department
10	**Course level**	Fifth year
11	**Year of study and semester (s)**	2021/2022 Second Semester
12	**Other department (s) involved in teaching the course**	None
13	**Main teaching language**	English
14	**Delivery method**	☐Face to face learning ■Blended ☐Fully online
15	**Online platforms(s)**	■Moodle ■Microsoft Teams ☐Skype ☐Zoom ☐Others……
16	**Issuing/Revision Date**	3/3/2022

17 Course Coordinator:

Name: Dr. Musa AlYaman Contact hours: Monday 12:30-13:30, Thursday 12:30-13:30

Office number: **202** Mechatronics Engineering Department Phone number: : 5355000 Ext. 23032

Email: m.alyaman@ju.edu.jo

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18 Other instructors:

None

19 Course Description:

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

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

(CNC)

B- Students Learning Outcomes (SLOs):

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

SLOs / SLOs of the course	SLO (1)	SLO (2)	SLO (3)	SLO (4)	SLO (5)	SLO (6)	SLO (7)
1. To be able to read machines electrical ladder diagrams including pneumatic sensors and pneumatic circuits		X					
2. To be able to write simple CNC G-code programming		X					
3. 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		X					
4. Understand the basics of Digital logic design.		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	5	Face to face	Section 1	Synchronous		Monday 28/2/2022
	1.2	Chapter 1 (Introduction to Automation)	5	**Fully Online**	Teams	Synchronous		Wednesday 2/3/2022
2	2.1	Chapter2 (Sensors)	5	Face to face	Section 1	Synchronous		Monday 7/3/2022
	2.2	Chapter2 (Sensors)	5	**Fully Online**	Teams	Synchronous		Wednesday 9/3/2022
3	3.1	Chapter2 (Sensors)	5	Face to face	Section 1	Synchronous		Monday 14/3/2022
	3.2	Chapter2 (Sensors)	5	**Fully Online**	Teams	Synchronous		Wednesday 16/3/2022
4	4.1	Chapter 3 (Actuators)	5	Face to face	Section 1	Synchronous	Q1 (Chapter2)	Monday 21/3/2022
	4.2	Chapter 3 (Actuators)	5	**Fully Online**	Teams	Synchronous		Wednesday 23/3/2022
5	5.1	Chapter 3 (Actuators)	2	Face to face	Section 1	Synchronous		Monday 28/3/2022
	5.2	Chapter 3 (Actuators)	2	**Fully Online**	Teams	Synchronous		Wednesday 30/3/2022
6	6.1	Chapter 4 (PLC)	2	Face to face	Section 1	Synchronous		Monday 4/4/2022
	6.2	Chapter 4 (PLC)	2	**Fully Online**	Teams	Synchronous		Wednesday 6/4/2022
7	7.1	Chapter 5	2	Face to face	Section 1	Synchronous		Monday 11/4/2022

		(Basic Programming 1)						
	7.2	Chapter 5 (Basic Programming 1)	2	**Fully Online**	Teams	Synchronous		Wednesday 13/4/2022
8	8.1	Chapter 5 (Basic Programming 1)	2	Face to face	Section 1	Synchronous		Monday 18/4/2022
	8.2	Chapter 5 (Basic Programming 1)	2	**Fully Online**	Teams	Synchronous		Wednesday 20/4/2022
9	9.1	Mid exam Chapters (1-5)	2	Face to face	Section 1	Synchronous	**Mid Exam 11:30-12:30**	Monday 25/4/2022
	9.2	Chapter 6 (Basic Programming 2)	2	**Fully Online**	Teams	Synchronous	**Project Available: 10:30**	Wednesday 27/4/2022
10	10.1	Chapter 6 (Basic Programming 2)	2	Face to face	Section 1	Synchronous		Monday 9/5/2022
	10.2	Chapter 6 (Basic Programming 2)	2	**Fully Online**	Teams	Synchronous		Wednesday 11/5/2022
11	11.1	Chapter 6 (Basic Programming 2)	2	Face to face	Section 1	Synchronous	Q2 (Chapter6)	Monday 16/5/2022
	11.2	Chapter 7 (Advance Programming)	2	**Fully Online**	Teams	Synchronous		Wednesday 18/5/2022
12	12.1	Chapter 7 (Advance Programming)	2	**Face to Face**	Section 1	Synchronous		Monday 23/5/2022
	12.2							Wednesday 25/5/2022
13	13.1	Chapter 8 (CNC)	2	Face to face	Section 1	Synchronous		Monday 30/5/2022

	13.2	Chapter 8 (CNC)	2	**Fully Online**	Teams	Synchronous	**Project Due:10:30**	Wednesday 1/6/2022
14	14.1	Chapter 9 (Robotics)	2	Face to face	Section 1	Synchronous	Q3 (Chapter8)	Monday 6/6/2022
	14.2	Chapter 9 (Robotics)	2	**Fully Online**	Teams	Synchronous		Wednesday 8/6//2022
15	15.1							
	15.2							

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
Lab work	**10**		2		Face to face
Project	**10**		2	9th	Moodle
Quizzes	**10**	Chapters 2, 6 and 8	2	4th , 11th and 14th	Face to face
Midterm Exam	**30** (**20**+10)	Chapters 1-5	2	9th Week (Monday 25/4/2022)	Face to face
Final Exam	**40** (**30**+10)	All topics	2		Face to face

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:

Automation, Production Systems, and Computer Integrated Manufacturing, Mikell P. Groover, Printice Hall, 2008, 3rd Edition. ISBN-13: 978- 0132393218

B- Recommended books, materials, and media:

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

Digital System Design, M. Mano, Prentice Hall, 2002, 3rd Edition. ISBN: 0-13-062121-8:

26 Additional information:

Name of Course Coordinator: Dr. Musa AlYaman-----Signature: ---------- Date: 3/3/2022
Head of Curriculum Committee/Department: ---------- Signature: ----------
Head of Department: ---------- Signature: ----------
Head of Curriculum Committee/Faculty: ---------- Signature: ----------
Dean: ---------- Signature: ----------