

## Course Syllabus

1	<b>Course title</b>	Electrical Machines
2	<b>Course number</b>	0908321
3	<b>Credit hours</b>	3
	<b>Contact hours (theory, practical)</b>	3 theoretical hours
4	<b>Prerequisites/corequisites</b>	Electrical Circuits (0913213)
5	<b>Program title</b>	B.Sc. in Computer Engineering
6	<b>Program code</b>	0908321
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>	Third 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: [m.alyaman@ju.edu.jo](mailto:m.alyaman@ju.edu.jo)



### 18 Other instructors:

None

### 19 Course Description:

Magnetic circuits; single-phase transformers: Principles, analysis, performance characteristics and testing; DC motors: principle of operation; methods of starting and control; Three-phase AC induction motors: principle of operation; methods of starting, testing and speed control. AC three-phase synchronous motors: principle of operation; methods of starting, testing and speed control. Stepper motor: principle of operation; methods of control. Servo-motors (AC and DC): principle of operation; methods of control. Criteria of selection of the different types of motors for various applications, Sizing calculation for several application.

### 20 Course aims and outcomes:

#### A- Aims:

This is the main course in which computer engineering students study the discipline of electrical machines (mainly rotary electromagnetic actuators).

#### B- Intended Learning Outcomes (ILOs):

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

- Understand electromagnetic and electromechanical conversion principles including the motor effect and the generator effect.
- Understand single phase transformers; Principles, analysis; performance characteristics and tests to establish parameters.
- Understand DC Motors; Principles, analysis; performance characteristics.
- Understand 3-phase induction Motors; Principles, analysis; performance characteristics.
- Understand stepper motors; Principles, and control.
- Understand servo motors; Principles, and control.
- Be able to obtain the nameplate for a motor and analyses its parameters.

## 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		Monday 10/10/2022
	1.2	Chapter 1 (Introduction to Machinery Principles )  Slides (1-5)	4	Face to Face	Chapter1_Lec1	Synchronous		Wednesday 12/10/2022
	1.3							
2	2.1	Chapter 1 (Introduction to Machinery Principles )  Slides (6-14)	4	Face to Face	Chapter1_Lec2_P1 + Chapter1_Lec2_P2	Synchronous		Monday 17/10/2022
	2.2	Chapter 1 (Introduction to Machinery Principles )  Slides (15-20)	4	Face to Face	Chapter1_Lec3_P1 + Chapter1_Lec3_P2	Synchronous		Wednesday 19/10/2022
	2.3							
3	3.1	Chapter 1 (Introduction to Machinery Principles )  Slides (20-25)	4	Face to Face	Chapter1_Lec4_P1 + Chapter1_Lec4_P2	Synchronous		Monday 24/10/2022
	3.2	Chapter 2 Transformers  Slides (1-8)	4	Face to Face	Chapter2_Lec1_P1 +	Synchronous		Wednesday 26/10/2022

					Chapter2_Lec1_P2			
	3.3							
4	4.1	Chapter 2 Transformers Slides (9-15)	4	Face to Face	Chapter2_Lec2_P1 + Chapter2_Lec2_P2	Synchronous		Monday 31/10/2022
	4.2	Chapter 3 DC Machinery Fundamentals Slides (1-9)	4	Face to Face	Section 1 Chapter3_Lec1_P1 + Chapter3_Lec1_P2	Synchronous	Q1 (Chapter 1)	Wednesday 2/11/2022
	4.3							
5	5.1	Chapter 3 DC Machinery Fundamentals Slides (9-12)	4	Face to Face	Chapter3_Lec2_P1 + Chapter3_Lec2_P2	Synchronous		Monday 7/11/2022
	5.2	Chapter 3 DC Machinery Fundamentals Slides (12-15)	4	Face to Face	Chapter3_Lec3_P1 + Chapter3_Lec3_P2	Synchronous		Wednesday 9/11/2022
	5.3							
6	6.1	Chapter 4 DC Motors and Generators Slides (1-5)	4	Face to Face	Chapter4_Lec1_P1 + Chapter4_Lec1_P2	Synchronous		Monday 14/11/2022

	6.2	Chapter 4 DC Motors and Generators  Slides (6-10)	4	Face to Face	Chapter4_Lec2_P1 + Chapter4_Lec2_P2	Synchronous		Wednesday 16/11/2022
	6.3							
7	7.1	Chapter 4 DC Motors and Generators  Slides (11-15)	4	Face to Face	Chapter4_Lec3_P1 + Chapter4_Lec3_P2	Synchronous		Monday 21/11/2022
	7.2	Chapter 4 DC Motors and Generators  Slides (16-23)	4	Face to Face	Chapter4_Lec4_P1 + Chapter4_Lec4_P2	Synchronous		Wednesday 23/11/2022
	7.3							
8	8.1	Chapter 5 AC Machinery Fundamentals  Slides (1-6)	4	Face to Face	Chapter5_Lec1_P1 + Chapter5_Lec1_P2	Synchronous	Q2 (Chapter 4)	Monday 28/11/2022
	8.2	Chapter 5 AC Machinery Fundamentals  Slides (7-11)	4	Face to Face	Chapter5_Lec2_P1 + Chapter5_Lec2_P2			Wednesday 30/11/2022
	8.3							
9	9.1	Mid Review	4	Face to Face		Synchronous		Monday 5/12/2022

	9.2	Mid Exam Chapters (1-4)	4	Face to Face		Synchronous	Mid Exam 11:30-13:00	Wednesday 7/12/2022
	9.3							
10	10.1	Chapter 6 Induction Motors Slides (1-10)	4	Face to Face	Chapter6_Lec1_P1 + Chapter6_Lec1_P2	Synchronous		Monday 12/12/2022
	10.2	Chapter 6 Induction Motors Slides (11-15)	4	Face to Face	Chapter6_Lec2	Synchronous		Wednesday 14/12/2022
	10.3							
11	11.1	Chapter 6 Induction Motors Slides (15-20)	4	Face to Face	Chapter6_Lec3_P1 + Chapter6_Lec3_P2	Synchronous		Monday 19/12/2022
	11.2	Chapter 6 Catchup	4	Face to Face		Synchronous		Wednesday 21/12/2022
	11.3							
12	12.1	Chapter 7 Synchronous Machines Slides (1-7)	4	Face to Face	Chapter7_Lec1	Synchronous		Monday 26/12/2023
	12.2	Chapter 7 Synchronous Machines Slides (8-13)	4	Face to Face	Chapter7_Lec2	Synchronous	Q3 (Chapter 6)	Wednesday 28/12/2023
	12.3							
13	13.1	Chapter 8	4	Face to Face	Chapter8_Lec1_P1	Synchronous		Monday 2/1/2023

		Special-Purpose Motors Slides (1-8)			+ Chapter8_Lec1_P2			
	13.2	Chapter 8 Special-Purpose Motors Slides (9-19)	4	Face to Face	Chapter8_Lec2_P1 + Chapter8_Lec2_P2	Synchronous		Wednesday 4/1/2023
	13.3							
14	14.1	Chapter 9 Motor Sizing Slides (1-10)	4	Face to Face	Chapter9_Lec1_P1	Synchronous		Monday 9/1/2023
	14.2	Chapter 9 Motor Sizing Slides (11-14)	4	Face to Face	Chapter9_Lec1_P2	Synchronous		Wednesday 11/1/2023
	14.3							
15	15.1	Course Discussion and Feedback	5	Face to face				Monday 16/1/2023
	15.2							Wednesday 18/1/2023
	15.3							

## 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	Chapters 1, 4 and 6	4	4 <sup>th</sup> , 8 <sup>th</sup> , and 12 <sup>th</sup>	Moodle
Project	10		4		Moodle
Midterm Exam	30	Chapters 1-4	4	9 <sup>th</sup> week Wednesday 7/12/2022	Moodle



Final Exam	50	All topics	4		Moodle
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## 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:**

Electric Machinery Fundamentals, Stephen J. Chapman 5th Edition McGraw-Hill

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

Lecture note

**26 Additional information:**

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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: -----