جامعة الإسراء
ISRA UNIVERSITY

COURSE Syllabus

Course Name: Electrical Machines Laboratory

Course Number: 04083152

General Course Information:

Course title	**Electrical Machines Laboratory**
Course number	**04083152**
Credit hours (theory, practical)	**1 Credit Hour Practical**
Contact hours (theory, practical)	**3 Hours Practical**
Prerequisites/corequisites	**04083151 (Electrical Machines)**
Academic Program	**Renewable Energy Engineering, Communication & Electronics Engineering**
Program code	**REE**
Awarding institution	**Isra University**
Faculty	**Engineering**
Department	**Renewable Energy Engineering**
Level of course	**Third Year**
Academic year /semester	**2021 – 2022 / 2nd Semester**
Awarded qualification	**Bachelor's degree**
Other departments involved in teaching the course	**Communication & Electronics Engineering**
Language of instruction	**English**
Date of production/revision	**18 / 6 / 2022**

Course Coordinator:

Coordinator's Name: Dr. Zakaria Al-Omari
Office No.:
Office Phone:
Office Hours:
Email: Zakaria.alomari@iu.edu.jo

Other Instructors:

Instructor's Name:
Office No.:
Office Phone:
Office Hours:
Email:

Course Description:

Transformers: Single phase, Three-phase Transformers; DC Machines: Motors, Generators; Three-phase Synchronous Machines: Motors, Generators; Three-phase Induction Motors: Squirrel Cage Rotor, Wound Rotor (Slip-ring)..

Textbook: ***Author(s), Title, Publisher, Edition, Year, Book website.***

1. Electrical Machines Lab Manual

References: ***Author(s), Title, Publisher, Edition, Year, Book website.***

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

1. Stephen J. Chapman, "Electric Machinery Fundamentals", McGraw-Hill, 5th Edition, 2012. http://www.elcomhu.com/Mechatronics/Machines/Electric%20Machinery%20Fundamentals%20%205th%20Ed%20%20By%20Stephen%20J%20Chapman.pdf
2. A. E. Fitzgerald. Charles Kingsley, Jr., Stephen D. Umans, "Electric Machinery", McGraw-Hill, 7th Edition, 2014. http://epp.etf.rs/wp/wp-content/uploads/2018/03/Fitzgerald_Electric_Machinery_6th_ed.pdf

Course Educational Objectives (CEOs):

1.	**Enables the students in the basic fundamentals related to the principle, construction, and operation of Transformer, AC, and DC Machines and gives them the experimental skill.**
2.	**Enables the students to measure the performance of a transformer, AC, and DC Machines by conducting various tests and calculating the parameters.**
3.	**Enables the students to basic skills needed to test and analyze the performance leading to the design of electric machines.**
4.	**Enables the students to work in a group and evaluate the results to prepare the report.**

Intended Learning Outcomes (ILO's):

	Intended Learning Outcomes (ILO's)	Relationship to CEOs	Contribution to PLOs	Bloom Taxonomy Levels*	Descriptors**
A	**Knowledge and Understanding:**				
A1	**Understand the no-load and load characteristics of single-phase and three-phase transformers.**	**1, 2, 3, 4**	**1, 5**	**1**	
A2	**Apply the knowledge of transformer, AC, and DC machines in testing them for the study of speed control, efficiency calculation, and their various characteristics.**	**1, 2, 3, 4**	**1, 5**		
B	**Intellectual skills:**				
B1	**Realize the critical operation condition of some machines in some special conditions.**	**1, 2, 3**	**1, 5**		
B2	**Analyze the efficiency and characteristics of different electrical machines.**	**1, 2, 3**	**1, 5**		
C	**Subject-specific skills:**				
C1	**Ability to work with measurement units in the lab.**	**1, 2, 3**	**1, 5**		

***Bloom Taxonomy Levels**

1. Level #	1	2	3	4	5	6
2. Level Name	**Knowledge**	**Comprehension**	**Application**	**Analysis**	**Evaluation**	**Synthesis**

Topic Outline and Schedule:

Topic	Weeks	Achieved ILOs
	1	
Single-phase transformer	**2**	A1, A2, B2, C1
Three-phase transformer connections	**3**	A1, A2, B2, C1
Three-phase squirrel cage induction motors	**4**	A3, B1, B2, C1
Three-phase slipring induction motors	**5**	A3, B1, B2, C1
Open lap	**6**	
Midterm exam	**7**	
Three-phase synchronous generator	**8**	A3, B1, B2, C1
Three-phase synchronous motor	**9**	A3, B1, B2, C1
DC Motors	**10**	A3, B1, B2, C1
DC Generators	**11**	A3, B1, B2, C1
Open lap.	**12**	A3, B1, B2, C1
	13	
Final exam	**14**	

Teaching Methods and Assignments:

Development of ILOs is promoted through the following teaching and learning methods:

- **Conduct experiments.**
- **Analyze the results of the experiments**

Course Policies:

A- Attendance policies:

The maximum allowed absences is 15% of the lectures.

B- Absences from exams and handing in assignments on time:

First Exam and second exam can be retaken based on approval of excuse by the instructor's discretion.

Not handing assignment on time will incur penalties.

C- Academic Health and safety procedures

D- Honesty policy regarding cheating, plagiarism, and misbehaviour:

Cheating, plagiarism, misbehaviour will result in zero grade and further disciplinary actions may be taken.

E- Grading policy:

- All homework is to be posted online through the e-learning system.
- Exams will be marked within 72 hours and the marked exam papers will be handed to the students.

F- Available university services that support achievement in the course: **Labs, Library.**

Required equipment:

Assessment Tools implemented in the course:

- ☐ First Written Exam.
- ☐ Midterm Written Exam.
- ☐ Final Written Exam.
- ☐ Quizzes.
- ☐ Homework.
- ☐ Integrative Projects.
- ☐ Case Study.
- ☐ Written Reports.
- ☐ Participation in Lecture.
- ☐ Practice in the Lab.
- ☐ Illustrative Presentations.
- ☐ Oral Exams.
- ☐ Others (identify):

Program Learning Outcome (PLOs):

Program Learning Outcomes describe what students are expected to know and be able to do by the time of graduation. These relate to the knowledge, skills, and behaviors that students acquire as they progress through the program. A graduate of the (Renewable Energy Engineering) program will demonstrate.	
1.	An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2.	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
3.	An ability to communicate effectively with a range of audiences
4.	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
5.	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
6.	An ability to develop and conduct appropriate experimentation, analyze, and interpret data, and use engineering judgment to draw conclusions
7.	An ability to acquire and apply new knowledge as needed, using appropriate learning strategies

Responsible Persons and their Signatures:

Course Coordinator		**Completed Date**	
		Signature	

Received by (Department Head)		**Received Date**	
		Signature	