FUTURE UNIVERSITY IN EGYPT
جامعة المستقبل

Faculty of Engineering & Technology

Electrical Machines

Information :

Course Code :	EPR 340	**Level :**	Undergraduate	**Course Hours :**	3.00- Hours

Department : Department of Mechanical Engineering

Instructor Information :

Title	Name	Office hours
Lecturer	Mohamed Mahmoud Anwar Mohamed Sharawy	
Assistant Lecturer	Mohamed Abdallah Mahmoud Shaheen	2

Area Of Study :

This course aims to:
Understand the definitions and construction of magnetic circuit.
Recognize the construction, theory of operation, equivalent circuit, (voltage, current) equations, basic characteristics and testing of 1-ph Transformers
Empathize the construction, theory of operation, equivalent circuit, (voltage, current, power and torque) equations, basic characteristics and testing of DC Machines.
Understand the construction, theory of operation, equivalent circuit, (voltage, current, power and torque) equations, basic characteristics and testing of 3-ph Synchronous Machines.
Realize the construction, theory of operation, equivalent circuit, (voltage, current, power and torque) equations, basic characteristics and testing of 3-ph Induction Motors.
Develop practical skills and perform the required experiments to get the equivalent circuit parameters and load characteristics of each of the previous machines.
Share ideas and work in a team or a group.

Description :

Magnetic circuits. Construction, theory of operation, equivalent circuit, (voltage, current, power and torque) equations, basic characteristics, and experiments of each of the following machines: DC Machines, 1-ph Transformers, 3-ph Induction Motors, and 3-ph Synchronous Machines.

Course outcomes :

a.Knowledge and Understanding: :

1 -	Identify the magnetic circuit definitions and concepts.
2 -	Define knowledge and understanding of construction, theory of operation, equivalent circuit, and basic characteristics of 1-ph Transformers.
3 -	Recognize knowledge and understanding of construction, theory of operation, equivalent circuit, and basic characteristics of DC Machines.
4 -	Recognize knowledge and understanding of construction, theory of operation, equivalent circuit, and basic characteristics of 3-ph Synchronous Machines
5 -	Define knowledge and understanding of construction, theory of operation, equivalent circuit, and basic characteristics of 3-ph Induction Motors.

b.Intellectual Skills: :

1 -	Analyze and solve operating conditions of 1-ph Transformers.

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2 -	Employ and solve operating conditions of DC Machines.
3 -	Apply and solve operating conditions of 3-ph Synchronous Machines.
4 -	Illustrate and solve operating conditions of 3-ph Induction Motors.
5 -	Decide and chose among different solution alternatives.
6 -	Evaluate obtained results both individually or as a part of team.
c.Professional and Practical Skills: :	
1 -	Explore practical skills and perform the required experiments to get the equivalent circuit parameters of 1-ph Transformers.
2 -	Develop practical skills and perform the required experiments to get the load characteristics of DC Machines.
3 -	Develop practical skills and perform the required experiments to get the equivalent circuit parameters of 3-ph Synchronous Machines.
4 -	Apply practical skills and perform the required experiments to get the load characteristics of 3-ph Induction Motors.
d.General and Transferable Skills: :	
1 -	Write technical reports in accordance with standard scientific guidelines.
2 -	Work in a self-directed manner.
3 -	Work coherently and successfully as a part of a team in the Lab.
4 -	Analyze problems and use innovative thinking in their solution.

Course Topic And Contents :

Topic	No. of hours	Lecture	Tutorial / Practical
Electric power system components	4	2	2
3 phase systems	4	2	2
Magnetic circuits	8	4	4
1- phase transformer & 3-phase transformer	8	4	4
D. C. Machines	10	6	4
AC Machines	14	6	8
Lab session for DC Machine and Transformer	8	4	4
Lab session for AC Machines	4	2	2

Teaching And Learning Methodologies :

Interactive Lecturing
Problem solving
Experiential learning

Course Assessment :

Methods of assessment	Relative weight %	Week No	Assess What
Assignments, Participation, & Quizzes	30.00		

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Final Exam	40.00	16	
Mid-Term Exam 1	15.00	6	
Mid-Term Exam 2	15.00	11	

Recommended books :
rõSchaum's Electric Machines and Electromechanicsò, by Syed A. Nasar. Nasar

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