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 :

ÅDevelop the students' knowledge about the definitions and construction of magnetic systems.
ÅPrepare students to recognize the construction, theory of operation, equivalent circuit, of DC Machines, 1-ph Transformers, 3-ph Induction Motors, and 3-ph Synchronous Machines
ÅPrepare students to recognize the main characteristics and performance of DC Machines, 1-ph Transformers, 3-ph Induction Motors, and 3-ph Synchronous Machines
ÅDevelop student's practical skills and perform the required experiments to get the equivalent circuit parameters and load characteristics of each of the previous machines.

Description :

Magnetic circuits. Construction, theory of operation, equivalent circuit, (voltage, current, power and torque) equations, basic characteristics, performance: efficiency and voltage regulation or speed regulation, and testing (experiments) and 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 -	a1. Identify the magnetic circuit definitions and concepts.
2 -	a2. Explain the construction, theory of operation, equivalent circuit, and main characteristics of DC Machines.
3 -	a3. Demonstrate the construction, theory of operation, equivalent circuit, and main characteristics of 1-ph Transformers.
4 -	a4. Demonstrate the construction, theory of operation, equivalent circuit, and main characteristics of 3-ph Induction Motors.
5 -	a5. Demonstrate the construction, theory of operation, equivalent circuit, and main characteristics of 3-ph Synchronous Machines.
b.Intellectual Skills: :	
1 -	b1. Solve different types of magnetic systems.
2 -	b2. Analyze the operating conditions and performance of DC Machines.

3 -	b3. Analyze the operating conditions and performance of 1-ph Transformers.
4 -	b4. Determine the operating conditions and performance of 3-ph Induction Motors.
5 -	b5. Analyze the operating conditions and performance of 3-ph Synchronous Machines.
6 -	b6. Choose among different solution alternatives.
c.Professional and Practical Skills: :	
1 -	c1. Perform the required experiments on the equivalent circuit parameters of DC Machines.
2 -	c2. Perform the required experiments on the load characteristics of 1-ph Transformers.
3 -	c3. Perform the required experiments on the equivalent circuit parameters of 3-ph Induction Motors.
d.General and Transferable Skills: :	
1 -	d1. Work coherently and successfully as a part of a team in the Lab.
2 -	d2. Communicate effectively.
3 -	d3. Manage tasks, time, and resources effectively.
4 -	d4. Refer to relevant literatures.

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

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