FUTURE UNIVERSITY IN EGYPT جامعة المستقبل

Faculty of Engineering & Technology

Electric Drives

Information :

Course Code :	EPR 551	**Level :**	Undergraduate	**Course Hours :**	3.00- Hours

Department : Specialization of Electrical Power Engineering

Instructor Information :

Title	Name	Office hours
Professor	Hany Mohamed Hasanien Mohamed	4
Professor	Naggar Hassan Saad Hemdan	
Assistant Lecturer	Mohamed Abdallah Mahmoud Shaheen	5
Teaching Assistant	Abeer Tharwat Said Awad	
Teaching Assistant	Shahd Muhammed Anwer Muhammed Hamed	

Area Of Study :

The Main Goals of this course are:
ÅIdentify the main components of modern electric drives systems.
ÅComprehend the relation between the electric motor characteristics and the load characteristics
ÅIdentify different methods that can be used to control the speed of DC and AC motors

Description :

Basics of industrial motor control, Criteria for selecting drive components, DC motor drives, Equivalent circuit of DC motors, Permanent magnet DC motors, DC servomotors, Adjustable speed DC drives, Industrial examples, Electric Traction examples, Induction motor drives, Slip power recovery from an induction motor, Forced commutated, Variable frequency ac motor drives, Injection braking of induction motors, Synchronous motor drives, Stepper motor drives, Computer controlled drives.

Course outcomes :

a.Knowledge and Understanding: :	
1 -	a1. Define the main components of modern electric systems
2 -	a2. Identify the relation between the motor and load characteristics
3 -	a3. Describe the behavior of electric motors under different modes of operations
4 -	a4. Recognize the different control techniques for DC and AC drives
b.Intellectual Skills: :	
1 -	b1. Solve problems related to DC and AC drives systems
2 -	b2. Compare between different methods used for speed control
3 -	b3. Assess the performance of the drive system
4 -	b4. Select suitable methods for speed control of AC and DC motors

c.Professional and Practical Skills: :	
1 -	c1. Use computational facilities and techniques, measuring instruments, workshops and laboratory equipment to design experiments, collect, analyze and interpret results.
2 -	c2. Apply safe systems at work and observe the appropriate steps to manage risks
3 -	c3. Perform experiments related to electric drives under different loading conditions.
4 -	c4. Prepare and present technical reports.
d.General and Transferable Skills: :	
1 -	d1. Collaborate effectively within multidisciplinary team.
2 -	d2. Work in stressful environment and within constraints.
3 -	d3. Communicate effectively.
4 -	d4. Effectively manage tasks, time, and resources.

Course Topic And Contents :

Topic	No. of hours	Lecture	Tutorial / Practical
Characteristics of Motors & Loads, Equation of Motion	5		
Review of DC motors	5		
Classical speed control and braking of DC motors	20		
Introduction	5		
Speed control of DC motor using power electronic converters	15		
Review of AC motors	5		
Speed control and braking of AC motors	20		

Teaching And Learning Methodologies :

Interactive lectures

Experiential learning

Report writing

Course Assessment :

Methods of assessment	Relative weight %	Week No	Assess What
ÅFinal exam	40.00		
o Assignments	5.00		
o In Class Quizzes	10.00		
o Laboratory	10.00		
o Mid-Term exams	30.00		
o Participation	5.00		

Course Notes :

No course notes are required

Recommended books :

1) M. H. Rashid. Power Electronics: Circuits, Devices, and Applications, 4th ed. Pearson Education Inc., 2013.
2) Mohamed A. El-Sharkawi, Fundamentals of Electric Drives, Cengage Learning, 2000
3) Syed A. Nasar and Ion Boldea, Electric Drives, 3rd Edition, CRC Press, 2016