FUTURE UNIVERSITY IN EGYPT جامعة المستقبل

Faculty of Engineering & Technology

Electrical Circuits

Information :

Course Code :	EPR 266	**Level :**	Undergraduate	**Course Hours :**	4.00- Hours

Department : Department of Mechanical Engineering

Instructor Information :

Title	Name	Office hours
Lecturer	Mohamed Rizk Mohamed Elsayed Hamouda	
Teaching Assistant	Osama Ahmed Ibrahim Mohamed Montaser	1

Area Of Study :

ÅDevelop the students' knowledge about the fundamentals and main components of electrical circuits.
ÅPrepare students to analyze DC electrical circuits using different techniques and theorems.
ÅDevelop the students' knowledge about the characteristics of inductance and capacitance.
ÅPrepare students to analyze AC electrical circuits using different techniques and theorems.
ÅPrepare students to analyze steady state power in AC circuits and three phase systems.
ÅDevelop student's practical skills on testing electrical circuits.

Description :

combinations, voltage and current division. Techniques of solving DC electric circuits: nodal analysis and mesh analysis. Theorems: superposition, Th®veninôs theorem, and maximum power transfer. AC sinusoidal sources, time domain and frequency (phasor) domain, voltages and currents phasor diagrams, inductance and capacitance: voltage and current relationships, impedance and admittance, Techniques of solving AC electric circuits: nodal and mesh analysis. Theorems: superposition, and Th®veninôs theorem. Steady state power analysis: Real Power, complex power, and power measurement. Three phase circuits; connections: Y-Y, Y-delta, delta-Y, delta-delta, and power measurements.

Course outcomes :

a.Knowledge and Understanding: :	
1 -	a1. Describe the fundamentals and main components of electrical circuits including Ohm's law, Kirchhoffôs laws, resistance and source combinations, and voltage and current division.
2 -	a2. Illustrate techniques of electrical circuits including nodal and mesh analysis and source transformation
3 -	a3. Describe theorems for solving electrical circuits including superposition, and Th®veninôs theorem.
4 -	a4. Illustrate the characteristics of inductance and capacitance.
5 -	a5. Illustrate techniques and theorems of solving AC electric circuits.
6 -	a6. Describe steady state power in AC circuits.
7 -	a7. Compare between different schemes of three phase systems.
b.Intellectual Skills: :	
1 -	b1. Apply basic laws for solving simple electric circuits.

2 -	b2. Apply different techniques for solving DC electric circuits.
3 -	b3. Apply different theorems for solving DC electric circuits.
4 -	b6. Analyze steady state power in AC circuits and different schemes of three phase systems.
c.Professional and Practical Skills: :	
1 -	c1. Applying basic laws on simple circuits in the lab.
2 -	c2. Applying theorems for solving simple circuits in the lab.
3 -	c3. Practice basic experiments on 3-phase circuits.
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.

Course Topic And Contents :

Topic	No. of hours	Lecture	Tutorial / Practical
Basic concepts, components of Electric Circuits, basic laws.	5	3	2
Resistors in Parallel, Voltage Divider, Current Divider, and Delta-Way Transformation	5	3	2
Techniques of DC circuit analysis.	10	6	4
Theorems of DC circuit analysis.	10	6	4
AC sinusoidal sources, Time domain and frequency domain	5	3	2
Inductance and Capacitance	5	3	2
Phasor and impedance	5	3	2
Techniques and Theorems of AC circuit analysis	10	6	2
Steady state power analysis for AC circuits.	10	6	2
Three phase circuits.	10	6	2

Teaching And Learning Methodologies :

Interactive Lecturing
Problem solving
Experiential learning

Course Assessment :

Methods of assessment	Relative weight %	Week No	Assess What
Final exam	40.00		
In Class Quizzes	10.00		
Mid-Term exams	30.00		
Participations	10.00		
Performance and Lab	10.00		

Recommended books :
James W. Nilsson and Susan A. Riedel, ñElectric Circuitsò, 9th Edition, Prentice Hall, 2011.Lecture notes on the course Moodle page, FUE website. Charles K. Alexander and Matthew N. O. Sadiku, ñFundamental of Electric Circuits,ò5th Edition, McGraw Hill, 2013.