Faculty of Engineering & Technology

Electrical Circuits 1

Information :

Course Code :	EPR 261	Level	:	Undergraduate	Course Hours :	3.00- Hours

Department :	Department of Petroleum Engineering

Instructor Information :

Title	Name	Office hours
Associate Professor	Tarek Abd ElBadee Boghdady Mahmoud	2
Assistant Lecturer	YOUSSEF ELSAYED ABDELHAFEZ KANDIEL	
Teaching Assistant	Ahmed Elsayed Abdellatif Ibrahim Bedeir	

Area Of Study :

The Main Goals of this course are:
 Develop students knowledge about the fundamentals of electrical circuits.
 Train students to know the main components used of electrical circuits.
 Train students to analyze DC/AC electrical circuits.

Description :

Analysis of resistive circuits by simplifications (source transformations, combination of elements, star/delta and delta /star transformations, node and loop analysis), Sinusoidal steady state analysis, Phasor diagram representation,Network theorems (superposition, Thevenin, Norton, compensation and maximum power transfer), Analysis of circuits with AC excitation in the time domain, Analysis of AC circuits in the frequency domain using complex number algebra, Application of network theorems on alternating current circuits, Electric power, Complex power calculations and power factor, Circuits with nonlinear resistances, Analysis of electrical circuits with non-sinusoidal alternating currents, Higher order harmonics.

Course outcomes :

a.Knowledge and Understanding: :

1 -	Demonstrate functions of components and concepts electrical circuits including Ohm's Law, Kirchhoff's Laws, resistance and source combinations, and voltage and current division
2 -	Illustrate solving techniques of electrical circuits including nodal and mesh analysis and source transformation
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4 -	Illustrate the characteristics of inductance and capacitance
5 -	Define the impedance, admittance, and phasors for solving AC electric circuits

b.Intellectual Skills: :

1 -	Apply different techniques and theorems for solving electric circuits
2 -	Choose among different solution alternatives
3 -	Compare between solutions of AC and DC circuits

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Course Topic And Contents :

Topic	No. of hours	Lecture	Tutorial / Practical
Basic concepts, components of Electric Circuits	10	6	4
Basic laws, and voltage and current division	10	6	4
Techniques of DC circuit analysis	10	6	4
Theorems of DC circuit analysis	10	6	4
AC sinusoidal sources, Time domain and frequency domain	10	6	4
Inductance and Capacitance, Phasor, impedance	15	9	6
Techniques and Theorems of AC circuit analysis	10	6	4

Teaching And Learning Methodologies :

Interactive Lecturing

Problem solving

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		
Performance/Attendance	20.00		

Course Notes :

Course Handouts

Recommended books :

1. Text Book:
C.K. Alexander and M.N.O. Sadiku, Fundamentals of Electric Circuits,
McGraw Hill, 4th edition, 2009.
2. Recommended Readings:
a) J. David Irwin and Robert M. Nelms, Basic Engineering Circuit Analysis,
Wiley, most recent edition.
b) James W. Nilsson and Susan A. Riedel, Electric Circuits, Addison
Wesley, most recent edition.