

Faculty of Engineering & Technology

Electrical Circuits 2

Information :

Course Code : EPR 263

Level : Undergraduate

Course Hours : 4.00- Hours

Department : Department of Electrical Engineering

Instructor Information :

Title	Name	Office hours
Associate Professor	Moneer Mohamed Ali Abu-Elnaga	6
Teaching Assistant	Ahmed Moreab Hussien Mohamed	

Area Of Study :

Upon successful completion of the course, the student should be able to:

- understand the transient performance of 1st and 2nd order circuits.
- develop the steady state power analysis for circuits with sinusoidal sources and apply maximum power transfer theorem on AC electrics.
- understand the operation of 3-phase circuits with different connections.
- know the performance of magnetically coupled circuits and linear transformers.
- understand the frequency response of circuits supplied by a variable frequency sources and the concepts of resonance circuits.
- develop practical skills of testing 1st and 2nd order circuits during transient, 3-phase circuits.

Description :

Transient analysis in R-L, R-C, and RLC circuits. Steady state power analysis for circuits with sinusoidal sources. Maximum power transfer theorem. Three phase circuits; connections, transformations, and power measurements. Magnetically coupled circuits: linear transformer equivalent circuits, ideal transformer. Frequency response, Series and parallel resonance circuits, Quality factor, 3 dB bandwidth, Resonance in mutually coupled circuits.

Course outcomes :

a.Knowledge and Understanding: :

1 -	a1. Demonstrate the transient performance of 1st order and 2nd order electrical circuits.
2 -	a2. Demonstrate knowledge and understanding of AC power analysis.
3 -	a3. Describe three phase circuits with different connections.
4 -	a4. Understand magnetically coupled circuits.
5 -	a5. Illustrate the frequency response of resonant circuits.
6 -	a6. Establish the equivalent circuits of different two-port networks.

b.Intellectual Skills: :

1 -	b1. Evaluate the transient performance of 1st and 2nd order circuits.
2 -	b2. Perform basic calculations of AC power analysis.

3 -	b3. Examine different connections of three phase circuits.
4 -	b4. Perform basic calculations of magnetically coupled circuits.
5 -	b5. Evaluate the frequency response of resonant circuits.

c. Professional and Practical Skills: :

1 -	c1. Develop practical skills of testing 1st and 2nd order circuits during transient.
2 -	c2. Practice basic experiments on 3-phase circuits.
3 -	c3. Test the frequency response of resonant 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. Effectively manage tasks, time, and resources.

Course Topic And Contents :

Topic	No. of hours	Lecture	Tutorial / Practical
Transient analysis in R-L and R-C circuits.	18	9	9
Transient analysis in RLC circuits.	12	6	6
Steady state power analysis for AC circuits.	12	6	6
Three phase circuits.	12	6	6
Magnetically coupled circuits	12	6	6
Frequency response and resonance circuits.	12	6	6
Revision on Electric Circuits 1	6	3	3
Two-port networks.	6	3	3

Teaching And Learning Methodologies :

Lectures.
Tutorials.
E-Learning Program.
Laboratories.

Course Assessment :

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

Books :

Book	Author	Publisher
Fundamentals of Electric Circuits	Alexander Sadiku	McGraw Hill

Recommended books :

2. "Basic Engineering Circuit Analysis", J. D. Irwin, Fourth edition, Macmillan, most recent edition.
3. "Electric Circuits", James W. Nilsson and Susan A. Riedel, Addison Wesley, most recent edition. Ramsey.