EE 232- Electrical Circuits II

CREDIT HOURS
3 Hours

CONTACT HOURS (Hours/week)
Lecture: 2; Tutorial: 2; Lab: 2

COURSE COORDINATOR
Prof. Yasser Galal

TEXT BOOK:
J. Nilson & S.Riedel, "Electrical circuits", Prentice Hall, latest edition

COURSE DESCRIPTION:

AC series circuit and series response revision. Parallel circuit and Δ to Y simplification. Source transformation, superposition, the node voltage method and the mesh current method. Thevenin theorem. Complex power and maximum power calculations. Three-phase voltage sources. Analysis of the balanced Y-Y circuit. Analysis of the Y-Δ & Δ-Y circuit and Δ-Δ a circuit. Complex power calculation in three-phase. Unbalanced and four wire three phase loads. Unbalanced Y loads with neutral (wire disconnected) or having Zo. Inductances and capacitors, series-parallel combinations. The natural response for RL circuit. The natural response of RC circuit. General solution of step response of RL and RC circuit. Sequential switching.

PREREQUISITE:
EE 231

RELATION OF COURSE TO PROGRAM:
Required

COURSE INSTRUCTION OUTCOMES:
The student is capable of applying different circuit theories to AC circuits. He/ She gains detailed knowledge on balanced and unbalanced three phase circuits as well as on natural and step response of RL and RC circuits.

TOPICS COVERED:

- Revision on alternate current series circuit.
- Source transformation method; Node voltage method, Mesh current method, Thevenin theorem.
- Complex power and maximum power calculations.

- Three-phase balanced and unbalanced systems.
- Power calculations in 3-phase systems.
- Natural and step response in RLC circuits.
- Sequential switching.

CONTRIBUTION OF COURSE TO MEET THE REQUIREMSNTS OF CRITERION 5:

Professional Component Content			
Math and Basic Sciences	**Engineering Topics**	**General Education**	**Engineering Design**
	✓		

RELATIONSHIP OF COURSE TO STUDENT OUTCOMES:

Student Outcomes		Course Outcomes
a.	An ability to apply knowledge of mathematics, science, and engineering.	✓
b.	An ability to design and conduct experiments, analyze and interpret data.	✓
c.	An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.	
d.	An ability to function on multi-disciplinary teams.	
e.	An ability to identify, formulate, and solve engineering problems.	✓
f.	An understanding of professional and ethical responsibility.	
g.	An ability to communicate effectively.	
h.	The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context	
i.	A recognition of the need for, and an ability to engage in life-long learning.	
j.	A knowledge of contemporary issues within and outside the electrical engineering profession.	
k.	An ability to use the techniques, skills, and modern engineering tools necessary for electrical engineering practice.	✓