EE 231 – ELECTRICAL CIRCUITS 1

CREDIT HOURS

3 Hours

CONTACT HOURS (Hours/week)

Lecture: 2; Tutorial: 2; Lab: 2

COURSE COORDINATOR

Dr. Khaled Shehata

TEXT BOOK

J. Nilson & S.Riedel, "Electrical circuits", Prentice Hall, 2001, latest edition

COURSE DESCRIPTION

Basic d-c circuit elements, series and parallel network. Ohm's law and 1st & 2nd Kirchhoff's laws. Nodal analysis. Mesh analysis. Basic network theorems "source transformation, super position , Thevenin's theorem and Norton's theorem. max. power transfer" . Alternating current fundamentals and a-c generation. R.M.S value and average value, form factor and crisp factor. Phasor concept. Relation between current and voltage in resistors, capacitors and inductor, Response of R-L and R-C circuits. Sinusoidal response of series R.L.C circuit. Series resonance.

PREREQUISITE:

BA 124

RELATION OF COURSE TO PROGRAM

Required

COURSE INSTRUCTION OUTCOMES

The student will be able to:

Know the basic tools to analysis and solve for the currents and voltages in each branch of d-c circuits and to introduce the concepts of a-c circuits such as phasor , wave , and response.

TOPICS COVERED

- Basic dc circuit elements, series and parallel Networks
- Ohm's law and Kirchoff's laws
- Nodal Analysis
- Mesh Analysis
- Electric circuit theorems "source transformation"
- Superposition
- Thevenin's Theorem and Norton Theorem
- Maximum power transfer
- Alternating current Fundamentals and AC generation
- RMS value, average value, form factor and crisp factor
- Phasor concept
- Relation between voltage and current in resistor, capacitor and inductor

- Response of RL and RC circuits
- Sinusoidal response of RLC circuit
- Series Resonance

CONTRIBUTION OF COURSE TO MEET THE REQUIREMENTS OF CRITERION 5:

Professional component Content			
Math and Basic Sciences	**Engineering Topics**	**General Education**	**Other**
	✓		

RELATIONSHIP OF COURSE TO STUDENT OUTCOMES:

Student Outcomes		Course aspects
A	An ability to apply knowledge of mathematics, science, and engineering	a_1 a_2
B	An ability to design and conduct experiments, analyze and interpret data.	b_1 b_2 b_3 b_4
C	An ability to design a system, component, or process to meet desired needs within realistic constraints such as economics, environmental, social, political, ethical, health, and safety, manufacturability, and sustainability	
D	An ability to function on multi-disciplinary teams.	d_1 d_2 d_3 d_4
E	An ability to identify, formulate, and solve engineering problems	
F	An understanding of professional and ethical responsibility	
G	An ability to communicate effectively	g_1 g_2 g_3
H	The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and social content	
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.	k