Course Number: **EE 204**

Course Title: Fundamentals of Electric Circuits (Non- EE students Course)

Course Description :

Basic laws: Ohm's law, KVL, KCL. Resistive networks. Circuit analysis techniques: node-voltage and mesh-current. Network theorems: Thevenin's, Norton's, source transformations, superposition, maximum power transfer. Energy storage elements. Phasor technique for steady-state sinusoidal response. Important power concepts of AC. Three-phase circuits.

Prerequisites :

Calculus II (MATH 102)

General Physics II (PHYS 102)

Textbook :

Clayton Paul, *FUNDAMENTALS OF ELECTRIC CIRCUIT ANALYSIS*, Wiley & Sons. Inc., 2001.

Other useful references and material :

James W. Nilsson & Susan A. Riedel, *Electric Circuits* (9th Edition), 2009,

Prentice Hall, ISBN 0-13-127760-X.

Richard C. Dorf, *Introduction to Electric Circuits,* 5th Ed., John Wiley and Sons, 2002.

Course objectives :

After successfully completing the course, the students will be able to

- understand basic concepts of DC and AC circuit behavior
- develop and solve mathematical representations for simple circuits;
- understand the use of circuit analysis theorems and methods;
- design an electric circuit.

Topics Covered :

- Ohm's law, KVL, KCL, Circuits without dependent sources;
- Resistive circuits, Nodal analysis, Mesh analysis;
- Source transformations, Thevenin's and Norton's equivalent;
- Maximum power transfer, Superposition principle;
- Inductors, Capacitors,
- Sinusoidal response, complex numbers;
- Phasors, Frequency domain analysis;
- Average power, Complex power, Power factor;
- Maximum power transfer in AC circuits.

Class/Laboratory Schedule :.

2 lectures per week, 50 minutes each and 3 hours lab per week.

Course Outcomes :

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

1. Apply knowledge of mathematics, science, and engineering to the analysis and design of electric circuits.

2. Identify, formulate, and solve engineering problems in the area of circuits.

3. Use the techniques, skills, and modern programming tools such as PSPICE, necessary for engineering practice.

4. Participate and function within multi-disciplinary teams.

5. Design a system to meet desired needs within realistic constraints.

Course Outcomes to Program Outcome Mapping:

Course Outcome	Program Outcome												
	a	b	c	d	e	f	g	h	i	j	k	l	m
1	X												
2					X								
3											X		
4		X											
5			X										

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