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Department of Electrical Engineering	
Electrical Circuits I (63211)	
Total Credits	**3**
major compulsory	
Prerequisites	P1 : General Physics II (22102)

Course Contents

Circuit variables &elements. Simple resistive circuits, techniques of circuit analysis. Inductance &capacitance. Natural &step response of RL, RC, RLC circuits, Sinusoidal steady state analysis

	Intended Learning Outcomes (ILO's)	Student Outcomes (SO's)	Contribution
1	Demonstrate a solid foundation of knowledge in the fundamentals of direct current electricity, and solid knowledge of problem solving techniques for the analysis of linear electric circuits	A	40 %
2	Understand resistive and energy storage elements and controlled sources.	A	10 %
3	Analyze the transient DC behavior of a circuit	E	35 %
4	Analyze the steady state behavior of an AC circuit	E	15 %

Textbook and/ or Refrences

Engineering circuit analysis. William H.Hayt; Jr.-Jack E.Kemmekly. McGraw-Hill &Electric circuits, James W. Nilsson. Addison- Wesely publishing company.

Assessment Criteria	Percent (%)
First Exam	20 %
Second Exam	20 %
Homeworks	10 %
Final Exam	50 %

Course Plan

Week	Topic
1	EXPERIMENTAL LAWS AND SIMPLE CIRCUITS: Ohm's law. Kirchhof's laws. Analysis of a single loop circuit. Voltage and current division.
2	Useful techniques of circuit analysis: Nodal analysis. Mesh analysis.
3	Useful techniques of circuit analysis: Linearity and superposition, source transformations.
4	Useful techniques of circuit analysis: Thevenin and Norton equivalents.
5	MIDTERM EXAM 1
6	INDUCTANCE AND CAPACITANCE: Integral relationships for the inductor and the capacitor. Inductance and capacitance combinations.
7	SOURCE- FREE RL AND RC CIRCUITS: RL circuit. Properties of the exponential response. RC circuit.
8	SOURCE- FREE RL AND RC CIRCUITS: Tutorial problems.
9	THE APPLICATION OF THE UNIT-STEP FORCING FUNCTION: The unit step forcing function. The natural and step response of RL circuits. Tutorial problems.
10	THE NATURAL AND STEP RESPONSES: RC circuits. Tutorial problems.
11	MIDTERM EXAM II
12	THE RLC CIRCUITS: The source-free parallel circuit The overdamped parallel RLC circuit. Critical damping. The underdamped parallel RLC circuit. Tutorial problems. THE RLC CIRCUITS: The source free series RLC circuit. Tutorial problems

13	THE RLC CIRCUITS: The complete response of the RLC circuit. Tutorial problems.
14	Sinusoidal steady state analysis, the complex forcing function, the phasor, impedance, admittance
15	Useful techniques in AC circuit analysis, Phasor diagrams.
16	Review and final exam