

No.	Title		
1.	Subject	Electric Circuits	
2.	Subject Code	KE009	
3.	Status	Major	
4.	Credit Hours	Four (4) [(3L +1T) x 14 weeks + 12 hours Lab]	
5.	Semester and Year	Semester 3	
6.	Pre-requisite	Nil	
7.	Mode of Delivery	Lectures, tutorials and laboratories	
8.	Assessment	Assignment	10%
		Laboratory Work	20%
		Class Test	10%
		Final Exam	60%
9.	Objectives	To introduce students to the modelling and analysis of simple D.C. and A.C. circuits as a basis for the additional study of basic electrical technology used in the design and analysis of electrical and electronic systems.	
10.	Learning Outcomes	<p>Upon the completion of the unit, the students will be able to:</p> <ol style="list-style-type: none"> 1. Solve simple DC circuits through the application of Kirchoff's and Ohm's Law in order to determine the currents, voltages and power in the circuit. 2. Calculate the magnitude and phase of the current flowing in the simple series (LR and CR) AC circuits and qualitatively appreciate the effect on power consumption. 3. Use Microsim software to solve simple circuit problems. 	
11.	Details of subject	Contents	Hours
		Chapter1: Basic electrical terminology Definitions of current, voltage, power and energy.	3L 1T
		Chapter 2: Resistors & Ohm's Law Resistance and resistivity, application problems, Resistors, types of resistors, colour coding and standard resistor values preferred values, Ohm's law. Series and parallel resistors.	6L 2T
		Chapter 3: Network Analysis Network reduction. Voltage and current division circuits.	6L 2T
		Chapter 4: Kirchoff's Laws Voltage and current laws.	6L 2T
		Chapter 5: Inductance Stored energy, series and parallel.	3L 1T
		Chapter 6: Capacitance Stored energy, series and parallel capacitors. Capacitor types.	3L 1T

		<p>Chapter 7: Alternating Current Fundamentals</p> <p>Sinewave: cycle, magnitude, frequency, phases and time period. Equations of alternating voltages and currents. Sinewave calculations: Average value, effective value, form factor, peak factor Phase difference – phasor representation.</p>	<p>6L 2T</p>
		<p>Chapter 8: Simple AC and DC circuits</p> <p>Inductance and capacitive reactance, series RL, RC and RLC circuits. Qualitative discussion of effect on power.</p>	<p>9L 3T</p>
		<p>Total</p>	<p>L = 42 hrs T = 14 hrs P = 12 hrs 68 hours</p>
12.	Main Reference	<p>1. Dorf, R. C. (1989). <i>Introduction to Electric Circuits</i> (2nd ed.). John Wiley & Sons.</p>	
13.	Additional Reference	<p>1. Boylestad, R. L. (1997). <i>Introductory to Circuit Analysis</i> (8th ed.). Prentice Hall.</p>	
14.	Practical/Lab Classes	<p>Students are required to do the following laboratory sessions, each of 2 hours duration: :</p> <ol style="list-style-type: none"> 1) Resistor Identification and Measurement 2) Voltage Measurement 3) Current Measurement 4) Study of AC waveforms 5) Resonance Circuits 6) Simulation of Electrical circuits using Microsim 	