

EEE1019	Foundations of Electrical and Electronics Engineering	L	T	P	J	C
		3	0	2	0	4
Pre-requisite	Nil	Syllabus version				
Anti-requisite		v. 1.0				
Course Objectives:						
1.To teach the simple problem of DC and AC circuits.						
2.To provide the knowledge of digital systems.						
3.To study the important concepts of electronics.						
Expected Course Outcome:						
1. Solve simple DC circuits using mesh and nodal analysis.						
2. Describe the RLC components with sinusoidal sources.						
3. Perform the various network theorems.						
4. Design of combinational circuits and synthesis of logic circuits.						
5. Formulate the sequential logic circuits.						
6. Utilize the basic concepts of semiconductor devices and circuits.						
7. Discuss the overview of communication engineering.						
8. Design and Conduct experiments, as well as analyze and interpret data						
Student Learning Outcomes (SLO):				1, 2, 5		
Module:1	Fundamental concepts and DC circuits:			6 Hours		
Basic circuit elements and sources, series and parallel connection of circuit elements, Ohm's Law, Kirchoff's Laws, Source transformation, Node Voltage Analysis, Mesh Current analysis.						
Module:2	Single phase AC Circuits:			6 Hours		

Introduction to AC circuits and concept of phasors for constant frequency sinusoidal sources. Steady state AC analysis of a RL, RC, RLC Series circuits, AC power calculations, Power factor, Series resonance.			
Module:3	Network Theorems (A.C. and D.C) :	5 Hours	
Thevenin’s and Norton's, Maximum power transfer and Superposition Theorems.			
Module:4	Digital Systems:	6 Hours	
Number system, Boolean algebra, Logic circuit concepts, Combinational circuit decoder, Encoder, Multiplexer, Demultiplexer, Half adder, Full adder, Synthesis of logic circuits.			
Module:5	Sequential logic circuits:	6 Hours	
Computer organization, Memory types, Flip Flops – SR, D, T, JK, Counters, Shift registers.			
Module:6	Semiconductor devices and circuits:	8 Hours	
Conduction in semiconductor materials, principle of operation, V-I characteristics of PN junction diode, Zener diode, BJT, MOSFET, IGBT, half wave rectifier, full wave rectifier, filters, Class A, Class B, Class C Amplifier.			
Module:7	Analog Modulation:	6 Hours	
Introduction, Inverting amplifier, Non-Inverting amplifier, Basic application of operational amplifier: Subtractor, Summing amplifier, Comparator, Integrator, Differentiator, Analog to Digital converter, Digital to Analog converter.			
Communication Engineering: Modulation and Demodulation - Amplitude and frequency modulation.			
Module:8	Lecture by industry experts.	2 Hours	
	Total Lecture hours:	Hours: 45	
List of Challenging Experiments (Indicative)			
Software Experiments			

1.	Analysis and verification of circuit using Mesh and Nodal analysis	3 hours
2.	Verification of network theorems using Maximum power transfer	3 hours
3.	Analysis of RLC series circuit	3 hours
4	Design of half adder and full adder	3 hours
5.	Single phase half wave and full wave rectifier	3 hours

#### Hardware Experiments

1.	Verification of network theorems using Thevenin's	3 hours
2.	Regulated power supply using Zener diode	3 hours
3.	Design of a lamp dimmer circuit using Darlington pair	3 hours
4	Staircase wiring layout for multi-storied building	3 hours
5.	Design and verification of logic circuit by simplifying the Boolean expression	3 hours
<b>Total Laboratory Hours</b>		<b>30 hours</b>

#### Text Book(s)

1.	Allan R. Hambley, 'Electrical Engineering - Principles & Applications, Pearson Education, First Impression, 6/e, 2013.
2.	John Bird, 'Electrical circuit theory and technology', Newnes publications, 4th Edition, 2010.

#### Reference Books

1.	Charles K Alexander, Mathew N O Sadiku, 'Fundamentals of Electric Circuits', Tata McGraw Hill, 2012.
2.	David A. Bell, 'Electronic Devices and Circuit', Oxford press-2008.
3.	D. Roy Choudhary, Shail B. Jain, 'Linear Integrated Circuits', 4th/e, New Age International, 2010.

**Mode of Evaluation:** CAT / Assignment / Quiz / FAT / Project / Seminar

<b>Recommended by Board of Studies</b>	30/11/2015		
<b>Approved by Academic Council</b>	39 <sup>th</sup> AC	Date	17/12/2015