EEE1001	Basic Electrical and Electronics Engineering	L	T	P	J	C
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Pre-requisite	**NIL**	**Syllabus version**				
		v. 1.0				

Course Objectives:

1. To understand the various laws and theorems applied to solve electric circuits and networks
2. To provide the students with an overview of the most important concepts in Electrical and Electronics Engineering which is the basic need for every engineer

Expected Course Outcome:

1. Solve basic electrical circuit problems using various laws and theorems
2. Analyze AC power circuits and networks, its measurement and safety concerns
3. Classify and compare various types of electrical machines
4. Design and implement various digital circuits
5. Analyze the characteristics of semiconductor devices and comprehend the various modulation techniques in communication engineering
6. Design and conduct experiments to analyze and interpret data

Student Learning Outcomes (SLO):	**1,2,9**

1. Having an ability to apply mathematics and science in engineering applications
2. Having a clear understanding of the subject related concepts and of contemporary issues
9. Having problem solving ability- solving social issues and engineering problems

Module:1	**DC circuits**	**5 hours**

Basic circuit elements and sources, Ohms law, Kirchhoff's laws, series and parallel connection of circuit elements, Node voltage analysis, Mesh current analysis, Thevenin's and Maximum power transfer theorem

Module:2	**AC circuits**	**6 hours**

Alternating voltages and currents, AC values, Single Phase RL, RC, RLC Series circuits, Power in AC circuits-Power Factor- Three Phase Systems – Star and Delta Connection- Three Phase Power Measurement – Electrical Safety –Fuses and Earthing, Residential wiring

Module:3	**Electrical Machines**	**7 hours**

Construction, Working Principle and applications of DC Machines, Transformers, Single phase and Three-phase Induction motors, Special Machines-Stepper motor, Servo Motor and BLDC motor

Module:4	**Digital Systems**	**5 hours**

Basic logic circuit concepts, Representation of Numerical Data in Binary Form- Combinational logic circuits, Synthesis of logic circuits

Module:5	**Semiconductor devices and Circuits**	**7 hours**

Conduction in Semiconductor materials, PN junction diodes, Zener diodes, BJTs, MOSFETs, Rectifiers, Feedback Amplifiers using transistors. Communication Engineering: Modulation and Demodulation - Amplitude and Frequency Modulation

	Total Lecture hours:	**30 hours**	

Text Book(s)				
1.	1. John Bird, 'Electrical circuit theory and technology ', Newnes publications, 4 t h Edition, 2010.			
Reference Books				
1.	Allan R. Hambley, 'Electrical Engineering -Principles & Applications' Pearson Education, First Impression, 6/e, 2013			
2.	Simon Haykin, 'Communication Systems', John Wiley & Sons, 5 t h Edition, 2009.			
3.	Charles K Alexander, Mathew N O Sadiku, 'Fundamentals of Electric Circuits', Tata McGraw Hill, 2012.			
4.	Batarseh, 'Power Electronics Circuits', Wiley, 2003			
5.	H. Hayt, J.E. Kemmerly and S. M. Durbin, 'Engineering Circuit Analysis', 6/e, Tata McGraw Hill, New Delhi, 2011.			
7.	Fitzgerald, Higgabogan, Grabel, 'Basic Electrical Engineering', 5t h edn, McGraw Hill, 2009.			
8.	S.L.Uppal, 'Electrical Wiring Estimating and Costing ', Khanna publishers, NewDelhi, 2008.			
Mode of Evaluation: CAT / Assignment / Quiz / FAT / Project / Seminar				
List of Challenging Experiments (Indicative)				
1.	Thevenin's and Maximum Power Transfer Theorems – Impedance matching of source and load			2 hours
2.	Sinusoidal steady state Response of RLC circuits			2 hours
3.	Three phase power measurement for ac loads			2 hours
4.	Staircase wiring circuit layout for multi storey building			2 hours
5.	Fabricate and test a PCB layout for a rectifier circuit			2 hours
6.	Half and full adder circuits.			2 hours
7.	Full wave Rectifier circuits used in DC power supplies. Study the characteristics of the semiconductor device used			2 hours
8.	Regulated power supply using zener diode. Study the characteristics of the Zener diode used			2 hours
9.	Lamp dimmer circuit (Darlington pair circuit using transistors) used in cars. Study the characteristics of the transistor used			2 hours
10.	Characteristics of MOSFET			2 hours
			Total Laboratory Hours	20 hours
Mode of assessment: Assignment / FAT				
Recommended by Board of Studies	**29/05/2015**			
Approved by Academic Council	**37th AC**	Date	**16/06/2015**	