ELECTRICAL ENGINEERING
BEG123EL

Year: I   Semester: II

Teaching Schedule Hours/Works			Examination Scheme				
L	P	T	Final		Internal Assessment		Total
			Theory	Practical	Theory	Practical	
3	2	1	80	-	20	25	125

Duration: 3 Hours

Course Objectives: This course serves as the foundation course on Basic Electrical Engineering. After the completion of this course, students will be able to Analyze A.C.&D.C Electric Circuits.

1. D. C. Circuit Analysis   (11 Hrs)
1.1. Concept of electric charge and current. Ohm's law its application and limitation.
1.2. Electric circuit, circuit elements
1.3. Resistance inductance and capacitance, their functional behavior, constructional features, mathematical descriptions
1.4. Introduction to voltage source and current source
1.5. Series and parallel connection of resistors
1.6. Series and parallel connection of sources effect of their internal resistance on the circuit characteristics
1.7. Star / delta transformation,
1.8. Power and energy in D.C. circuit

2. Circuit analysis   (16 Hrs)
2.1. Kirchoff's laws-current law and voltage law, application, limitations Superposition theorem reciprocity theorem
2.2. Nodal analysis of electric circuit
2.3. Superposition theorem
2.4. Thevenin's theorem
2.5. Norton's theorem
2.6. Reciprocity theorem
2.7. Maximum Power transfer theorem

3. A.C circuit   (10 Hrs)
3.1. Faraday's law of Electro magnetic induction, Generation of sinusoidal alternating emf, terminologies used in A.C. circuit.
3.2. Sinusoidal A.C., emf, phasor representation of A.C., j-operator and it use in A.C. circuit,
3.3. R, L and C excited by A.C.source, R-L, R-C, R-L-C series circuits, parallel A.C. circuit, Resonance in series and parallel R-L-C circuit, construction of phasor diagrams (vector diagrams)
3.4. Power and power factor in A.C. circuit

4. Three Phase A.C. Circuit   (8 Hrs)
4.1. Generation of three phase A.C. emf wave form representation, use of j-operator star and delta connection of source and load, line voltage and line current, phase voltage and phase current, balanced three phase system, calculation of current and voltage, measurement of power, three phase four wire system.

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Labs:

1. Basic electrical measurements and verification of ohms law.
2. Series and parallel connection of resistors, verification of Kirchoff's laws
3. Measurement of Power in DC. Circuit using Wattmeter.
4. Measurement of power in single phase ac circuit using wattmeter.
5. Measurement of rms value, amplitude value, power factor by using oscilloscope.
6. Measurement of power in three phase ac circuit.
7. Series resonance and parallel resonance.

References Books:

1. S. N. Tiwari & A. S. Gin Saroor, "A First Course In Electrical Engineering", A. H. Wheeler & Co. Ltd., Allahabad, India.
2. B. L. Theraja And A. K. Theraja, "A Test Book Of Electrical Technology", S. Chand & Co. Ltd., New Delhi, India.
3. V. Del Toro, "Principles Of Electrical Engineering", Prentice-Hall Of India, Ltd. New Delhi.
4. I. J. Nagrath, "Basic Electrical Engineering", Tata McGraw Hill, New Delhi.
5. P. S. Bhimbra, "Electric Machinery", Khanna Publishers, New Delhi.