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| Course No | | Course Name | L-T-P-Credits | |
| **EE 101** | | **Basic Electrical Engineering** | **2-0-0: 2** | |
| Prerequisite: nil; Co requisite: nil | | | | |
| **Course Objectives**:  1. To understand basic circuit theorems and laws  2. To develop the skills to analyze the basic DC/AC circuit systems | | | | |
| **SYLLABUS** | | | | |
| **Module** | **Contents** | | | **Hours** |
| I | **Analysis of DC circuits**  Mesh, node, branch, Ohm’s law, series and parallel circuit, basic devices: resistors, capacitors, inductors, dependent and independent sources, Kirchhoff’s Laws, Mesh and Node Analysis, Star-Delta conversion, Superposition theorem, Source conversion, Thevenin theorem, Norton theorem, Maximum power transfer theorem | | | 06 |
| II | **Electromagnetic Induction & Magnetic Circuit**  Magnetic field, Right hand rule, Left hand rule, Electromechanical laws, relation between electricity and magnetism, production of emfs (ac & dc), Faraday’s law of electromagnetic induction, direction of induced emf, Lenz law, dynamically and statically induced emfs, self-inductances, and mutual inductances, coefficient of coupling, Inductance in series and parallel, energy stored in a magnetic field. | | | 06 |
| III | **A.C Fundamentals and R.L.C circuits**  Phasors, Complex quantities, Application of complex algebra to A.C circuit, series and parallel RL, RC, RLC circuit, concept of impedance triangle, complex power: active, reactive and apparent power, power triangle, admittance triangle, series-parallel circuit. | | | 05 |
| IV | **Polyphase Networks**  Balanced two phase and three phase systems, Balanced Star-Delta connections, phase and line currents and voltages and their relations, Measurement of three phase power | | | 04 |
| V | **Measuring Instruments**  MC, MI and DM type instruments, energy meter.  **Elementary Overview of Electrical Machines:**  Principle, Construction and Types of different rotating electrical machines, transformers. | | | 03 |

**Essential Readings:**

1. A. Hussain, Fundamental of Electrical Engineering, Dhanpat Rai & Co. Ltd., 3rd edition, 2007.
2. V.N Mittle, Basic Electrical Engineering, Tata McGraw Hill, 2nd edition 2017.
3. A. Chakroborty, S. Nath and C.K. Chanda, “Basic Electrical Engineering”, McGraw Hill Education Pvt. Ltd., 1st Edition, 2009.
4. M.S. Sukhija and T.K. Nagsarkar, “Basic Electrical and Electronics Engineering”, Oxford University Press, 1st Edition, 2014.

**Supplementary Readings:**

1. H. Cotton, “Electrical Technology”, Pitman Publication, 7th edition 2005.
2. Hughes, “Electrical Technology”, Longman, 10th edition 2010.
3. John Bird, Electrical Circuit Theory and Technology, Routledge, Taylor & Francis Group, 4th edition 2010.
4. W.H. Hayt, J.E. Kemmerley, Engineering circuit analysis, Int. St. Ed. McGraw Hill, 8th edition 2013.