**COURSE CODE : EE1C01**

**COURSE TITLE** : **BASIC ELECTRICAL ENGINEERING**

**UNIVERSITY : DIBRUGARH UNIVERSITY**

**SEMESTER : FIRST SEMESTER**

**CREDIT : 04**

**L:T:P : 3:1:0**

**End sem. Examination for this course will carry 100 marks**

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| Module | Details of module | No. of Lectures |
| 1 | **D.C Networks**: Definition of active, passive, linear, non-linear circuit elements and network; Kirchoff’s laws; Node and mesh analysis; Voltage and current sources; Network Theorems: Superposition, Thevennin’s, Norton’s and Maximum power transfer. | 10 |
| 2 | **Single Phase A.C Circuits**: Waveforms of alternating voltage & current; Instantaneous, average and R.M.S. values; Form factor and peak factor; Forms of representation of alternating quantities; Concept of phasor and phasor diagrams; Concept of lead & lag; Reactance and impedances; **A.C. circuits**: resistive, inductive, R-L, R-C and R-L-C series, parallel and series-parallel combinations; Impedance and admittance triangle; Active and reactive power and power factor. | 10 |
| 3 | **Magnetic Circuits**: Definitions of mmf, flux density and reluctance; Comparison between electric and magnetic circuits; Series, parallel and seriesparallel circuits and their solutions; Energy stored in a magnetic field; Hysteresis and eddy current losses; Magnetically coupled circuits; Self inductance, mutual inductance and coupling coefficient; Analysis of coupled circuits; Dot-rule and equivalent conductively coupled forms of magnetically coupled circuits. | 6 |
| 4 | **Three-Phase Circuits**: Concept or three-phase A.C; Phase and line values in star and delta connections; Solutions or simple 3-phase balanced circuits with resistive and reactive loads; 3-phase power; Phase sequence. | 6 |
| 5 | **Instruments**: Classification of instruments; Essentials of indicating type of instruments: deflecting torque, controlling torque and damping torque; Types of indicating instruments; MC and MI type ammeters and voltmeters; Extension of range using shunt and multipliers; Errors and compensations. | 6 |
| 6 | **Basics of Electrical Installations**: Domestic wiring, Types of cables (names only); Types of wiring; **Circuit layouts**: single-phase A.C. mains to DB; 3-phase connections; **Accessories**: main switch, ceiling rose, fuse, MCB etc; Testing of wiring installation; The megger; **Earthing**: purpose and methods; **Lamps**: fluorescent tube and its connection and operation; Indian Electricity Rules regarding electrical installation. | 7 |
| Text Books:   1. A Text Book of Electrical Technology Vol I – B. L. Theraja, A. K. Theraja (S. Chand & Co.) 2. Engineering Circuit Analysis 6th Ed - William H. Hayt, Jr., Jack E. Kemmerly, Steven M. Durbin (McGraw-Hill, 2002). 3. Basic Electrical Technology - N. K. De, G. D. Ray and T. K. Bhattacharya (IIT Kharagpur) | | |