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| **BEE-XXX** | **Introduction to Electrical Engineering**  **(for Chemical Engineering Department)** | | | |
| **Course category** | | : | Engineering Fundamentals (EF) | |
| **Pre-requisite Subject** | | : | NIL | |
| **Contact hours/week** | | : | Lecture : 2, Tutorial : 0, Practical: 0 | |
| **Number of Credits** | | : | 2 | |
| **Course Assessment methods** | | : | Continuous assessment through tutorials, attendance, home assignments, quizzes, practical work, record, viva voce and One Minor tests and One Major Theory & Practical Examination. | |
| **Course Outcomes** | | : | The students are expected to be able to demonstrate the following knowledge, skills and attitudes after completing this course | |
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| 1. Understand the basic properties of electrical elements, and solve problem based on basic electrical circuits & DC network theorems. 2. Understand the fundamental behaviour of AC circuits and solve AC circuit problems. 3. Explain operative principle of transformer with background of magnetic circuits. | | | | |
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| **Topic Covered**  **UNIT I**  **D C Circuit Analysis:**  Circuit Concepts: Concepts of network, Active and passive elements, Voltage and current sources, Concept of linearity and linear network, Unilateral and bilateral elements, R, L and C as linear elements, Source transformation, Kirchhoff’s laws, Loop and nodal methods of analysis, Star-delta transformation. | | | | **6** |
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| **UNIT II**  **Network Theorems:**  Superposition theorem, Thevenin’s theorem, Norton’s theorem, Maximum Power Transfer theorem. | | | | **6** |
| **UNIT III**  **Single-Phase AC Circuits**  AC fundamentals: Sinusoidal, square and triangular waveforms – Average and effective values, Form and peak factors, Concept of phasor, phasor representation of sinusoidally varying voltage and current, Analysis of series, parallel and series-parallel RLC Circuits, Resonance in series and Parallel circuit | | | | **6** |
| **UNIT IV**  **Magnetic Circuit & Single-Phase Transformers:**  Magnetic circuit, concepts, analogy between electric & magnetic circuits, B-H curve, Hysteresis and eddy current losses.  Single Phase Transformer: Principle of operation, Construction, EMF equation, Power losses, Efficiency. | | | | **6** |
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| **Text Books:**   1. Fundamentals of Electric Circuits, C.K. Alexander and M.N.O. Sadiku; TATA McGraw-Hill. 2. Principles of Electrical Engineering, V. Del Toro; Prentice Hall International. 3. Electrical and Electronics Technology, Edward Hughes; Pearson. 4. Basic Electrical Engineering, D P Kothari, I.J. Nagarath; Tata McGraw Hill 5. Electrical Technology, B. L. Thareja and A. K. Thareja; S. Chand. | | | | |