

Course Outline:

1. Electric Circuit Fundamentals

- 1.1 Introduction to electrical quantities
 - 1.1.1 Atom and its Structure
 - 1.1.2 Electric current
 - 1.1.3 Electric; Voltage
- 1.2 Conductors, insulators and semi- conductors

2. The principal law of DC

- 2.1 The electric circuit and its elements
- 2.2 Resistance and conductance
- 2.3 Temperature coefficient of resistance
- 2.4 Ohm's law
- 2.5 Resistances in series and in parallel
- 2.6 Electric Power and Energy

3. Network theorems

- 3.1 Kirchhoffs laws
- 3.2 Current and voltage divider rule
- 3.3 Source conversion
- 3.4 Superposition theorem
- 3.5 Thevenin theorem
- 3.6 Norton's theorem
- 3.7 Maximirn power transfer theorem
- 3.8 Delta-star and star-delta transformation

4 Electric and Magnetic fields

- 4.1 Electric field and capacitance
- 4.2 Capacitance in series and in parallel
- 4.3 Energy stored in a capacitor
- 4.4 Magnetic circuits and Inductance
- 4.5 The current carrying conductor
- 4.6 Faradays Law of Electromagnetic Induction

5. Alternating voltage and current

- 5.1 Sinusoids (Alternating systems),
- 5.2 Generation of an alternating emf
- 5.3 Waveform terms and definitions
- 5.4 Average and r.m.s. values of an alternating current
- 5.5 Average and r.m.s, values of sinusoidal and non-sinuspidal currents and voltages
- 5.6 Representation of an alternating quantity by a phasor
- 5.7 Addition and subtraction of sinusoidal quantities

6. Single phase series circuits

- 6.1 AC in resistive, Capacitive and inductive circuit
- 6.2 Current and Voltage in an inductive circuit
- 6.3 Resistance and inductance in series,
- 6.4 Current and voltage in a capacitive circuit;
- 6.5 Resistance and capacitance in series
- 6.6 AC in an RLC circuit