B. Tech. (All Branches), Semester – I and II

ELE 205 AF/ELE 205 AS : ELECTROTECHNIQUES

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- ELECTROMAGNETISM (06 Hours)
  Biot-Savart law, magnetic field due to a current carrying conductor, magnetic field of an infinite linear conductor, magnetic field due to circular loop, field strength inside a solenoid, force on a current carrying conductor in magnetic field, force between two parallel linear conductors, hysteresis loop, Loss calculation, steelemitz exponent, eddy current loss, energy stored in a magnetic field, lifting power of a magnet.

- MAGNETIC CIRCUIT (04 Hours)
  Amperes circuitual law, analogy between electric & magnetic circuits, fringing, leakage, series, parallel, series-parallel circuits.

- ELECTROMAGNETIC INDUCTION (04 Hours)
  Faradays law, Lenz law, self-inductance, mutual inductance, coefficient of mutual inductance, coefficient of coupling, inductance in series, parallel, series-parallel.

- AC FUNDAMENTALS AND CIRCUITS (12 Hours)
  Alternating voltages and currents and their vector and time domain representations, average and RMS values, form factor, phase difference, power and power factor, purely resistive inductive and capacitive circuits, R-L, R-C, R-L-C series circuits, impedance and admittance, circuits in parallel, series and parallel resonance, Complex algebra and its application to circuit analysis.

- POLYPHASE CIRCUITS (08 Hours)
  Balanced two phase and three phase systems, star and mesh connections, calculations for balanced three phase networks, polyphase vector diagram, and measurement of power in three phase circuits.

- ELECTRICAL WIRING (02 Hours)
  Various types of residential wiring circuits as simple parallel circuits, stair case wiring, go down wiring.

- SINGLE PHASE TRANSFORMERS (08 Hours)
  Principle of transformer, construction - shell type, core type, transformer on no-load, with load, phasor diagram for transformer under no-load and loaded condition (with unity, lagging power factor load) equivalent circuit, open circuit and short circuit test, efficiency, voltage regulation.

- THREE-PHASE INDUCTION MOTORS (04 Hours)
  Rotating magnetic field, Principle of operation, slip, different power stages and equivalent circuit.

Total Hours: 48

BOOKS RECOMMENDED: