Sardar Vallabhbhai National Institute of Technology, Surat-395007
(A DEEMED UNITVERSITY)

DEPARTMENT OF ELECTRICAL ENGINEERING

	L	T	P	C
B. Tech. (All Branches), Semester – I and II				
ELE 205 AF/ELE 205 AS : ELECTROTECHNIQUES	**3**	**1**	**2**	**5**

- **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, steinmeitz exponent, eddy current loss, energy stored in a magnetic field, lifting power of a magnet.

- **MAGNETIC CIRCUIT** **(04 Hours)**

  Amperes circuital 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:

1. Kothari and Nagrath, “Basic electrical engineering”, 2nd edition, 2007, Tata McGraw-Hill Education.
2. Harry Cotton, “Principles of Electrical Technology”, 1967, Pitman.
3. V. N. Mittle & Arvind Mittal, “Basic electrical engineering”, 2nd edition, 2005, Tata McGraw-Hill Education.
4. Arthur Eugene Fitzgerald, David E. Higginbotham, “Basic Electrical Engineering”, 3rd edition, 1954, Tata McGraw-Hill Education.