

Year & Sem: E1S1	Course Code: EE1102	Course Name: Basic Electrical and Electronics Engineering	No. of Credits: 4	L	T&PS	P
				2	2	0

Unit I: Sources of energy; General structure of electrical power systems, Power transmission and distribution via overhead lines and underground cables, Steam, Hydel, Gas and Nuclear power generation. **DC Networks:** Kirchoff's laws, node voltage and mesh current methods, Delta-star and star-delta conversion, Superposition principle, Thevenin's and Norton's theorems.

Unit II: Single phase AC Circuits: Single phase EMF generation, average and effective values of sinusoids, solution of R,L,C series circuits, the j operator, complex representation of impedances, phase diagram, power factor, power in complex notation, solution of parallel and series- parallel circuits.

Unit III: Three phase AC Circuits : Three phase EMF generation, delta and Y connections, line and phase quantities, solution of three phase circuits, balanced supply voltage and balanced load, phasor diagram, easurement of power in three phase circuits, Three phase four wire circuits.

Unit IV: Magnetic Circuits : Ampere's circuital law, B- H curve, solution of magnetic circuits, hysteresis and eddy current losses, relays, an application of magnetic force, basic principles of stepper motor. **Transformers :** Construction, EMF equation, ratings, phasor diagram on no load and full load, equivalent circuit, regulation and efficiency calculations, open and short circuit tests, auto-transformers. **Induction Motor :** The revolving magnetic field, principle of orientation, ratings, equivalent circuit, Torque-speed characteristics, starters for cage and wound rotor type induction motors

Unit V: DC Machines :Construction, EMF and Torque equations, Characteristics of DC generators and motors, speed control of DC motors and DC motor starters **Electronics:** Introduction to electronics and electronic systems, Semiconductor and devices like diodes, BJT, FET, MOSFET, Rectifier and Filters, Transistor biasing. Small signal transistor amplifiers, Operational amplifiers, Feedback and Oscillators

.

Unit VI: Digital circuit and combinational logic, Sequential logic and flip-flops, ADC & DAC, Data acquisition systems, Memory systems, Case studies of electronic systems like microprocessors, radio & TV broadcasting, Mobile & cellular telephones, fiber optics & networking.

References/Text Books:

- 1.
- 2.

Lecture Plan: Unit-I & -II syllabus for MID-I, Unit-III & -IV syllabus for MID-II and Unit-V & -VI syllabus for MID-III examinations.