

Program	B. Tech CSE								
Year	I	Semester		I/II					
Course Name	Basic Electrical Engineering								
Code	NEE4101/NEE4201								
Course Type	ESC	L	T	P	Credit				
Pre-Requisite	Intermediate with PCM	3	1	0	4				
Course Objectives	1. This course provides comprehensive idea about circuit analysis. 2. The subject gives the knowledge about combinational circuits. 3. Subject gives the knowledge about the analysis and design of new electrical circuits. 4. Other logical working principles of machines and common Measuring instruments.								
Course Outcomes									
CO1	To understand basic theorem of electrical engineering.								
CO2	To understand the basic concepts of magnetic, AC & DC circuits.								
CO3	To explain the working principle, construction, applications of DC & AC machines & measuring instruments.								
CO4	To gain knowledge about the fundamentals of electric components, devices.								

Module	Course Contents	Contact Hrs.	Mappe d CO
1	Electric Circuit: Introduction to linear and nonlinear circuits, circuit elements, various sources and source transformation, Star delta transformation, solution of D.C. circuits using Kirchhoff's laws- Mesh Analysis and Nodal Analysis, Signal wave forms, Passive elements specifications. Basic theorems: Thevenin, Norton, Maximum Power, Superposition, Millman's Theorem, Tellegen's Theorem applied to DC networks.	30 Hours	CO1, CO2
2	A. C. Circuits: A.C. voltage and currents, average and r.m.s. values, Form factor and peak factor, Phasor representation of sinusoidal quantities, phasor in polar, rectangular and exponential forms. Analysis of single phase series, parallel and series-parallel circuits, Active & reactive and apparent power, p.f., Volt-amperes, frequency response and Q-factor. Analysis of balanced three phase a.c. circuits, Introductory concept, voltage, current and power in three phase balanced circuits. Star-delta connections. Measurement of three phase power by Wattmeter Method.	30 Hours	CO2
3	Measuring Instruments & Electromagnetic and Transformer: Types of instruments, construction, working principles & applications, PMMC, MI, Single phase dynamometer, Ammeter, Voltmeter, Wattmeter, Induction type Energy meter, Use of shunt and multiplier. Magnetic circuit concept, B-H curves characteristics of magnetic materials, Practical magnetic circuits. Magnetic circuits with D.C. and A.C. excitation, Hysteresis and eddy current losses, Magnetic force. Self and mutual inductances, Faraday's laws, Lenz's Law,	30 Hours	CO3

	<p>Statically and dynamically induced emfs, Energy stored in magnetic fields.</p> <p>Principle of Transformer operation, emf equation, Equivalent circuit of transformer, Losses and efficiency, Introduction of Auto Transformer and its applications.</p>		
	<p>Electrical Machines: Basic concepts of rotating electric machines, DC machines (motor and generator), working principle, types, EMF and torque equations characteristics and application of DC motor. Three phase induction motors, types, principle of operation, applications.</p> <p>Single phase induction motors, principle of operation, starting methods, applications. Synchronous machines (motor and generator), principle of operation and applications.</p>	30 Hours	CO4

Suggested Readings

1. 'Fundamental of Electric Circuits' by Charles K Alexander and Matthew N.O. Sadiku, Tata McGraw Hill Publication.
 2. 'Electrical Engineering Fundamentals' by Vincent Del Toro, PHI Publication.
 3. 'Basic Electrical Technology' by Kothari and I.J. Nagrath, Tata McGraw Hill.

Online Resources

1. <https://archive.nptel.ac.in/courses/108/108/108108076/>
 2. <https://nptel.ac.in/courses/108105112>
 3. <https://archive.nptel.ac.in/courses/108/105/108105112/>
 4. <https://archive.nptel.ac.in/courses/108/104/108104139/>