

GANPAT UNIVERSITY									
FACULTY OF ENGINEERING & TECHNOLOGY									
Programme	Bachelor of Technology				Branch/Spec.	ALL			
Semester	I / II				Version	2.0.0.0			
Effective from Academic Year	2018-2019				Effective for the batch Admitted in	July 2018			
Subject code	2ES103		Subject Name		Basic Electrical Engineering				
Teaching scheme					Examination scheme (Marks)				
(Per week)	Lecture(DT)		Practical(Lab.)		Total		CE	SEE	Total
	L	TU	P	TW					
Credit	3	0	1	0	4	Theory	40	60	100
Hours	3	0	2	0	5	Practical	30	20	50
Pre-requisites:									
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Learning Outcome:									
On successful completion of the subject, students should be able to									
<ul style="list-style-type: none"> ▪ To understand and analyze basic electrical and magnetic circuit. ▪ Apply basic electric laws in solving circuit problems and able to perform power calculation. ▪ Identify the types of capacitors and know the practical applications of various types of capacitors. ▪ Understand the basic concepts of Electromagnetic Induction. ▪ Understand the working principles of transformer and induction motor. ▪ To introduce the components of low voltage electrical installation. 									
Theory syllabus									
Unit	Content								Hrs
1	D.C. Circuits : Voltage and current Sources, Source Transformation, Star-Delta Transformation, Application of Kirchoff's Law, Superposition Theorem, Thevenin's Theorem and Norton's Theorem.								08
2	Capacitor : Types of Capacitor, Capacitance of Multiple Parallel Plate Capacitor, Energy stored in a Capacitor, Charging & Discharging of Capacitor & Time constant.								04
3	Magnetic circuit : Law of Magnetic Circuit, Series & parallel Magnetic Circuits and Calculation, Comparison of magnetic & Electric Circuit.								04
4	Electromagnetic Induction : Review of Faraday's Law, Lenz's Law, Self & Mutual Inductance, Inductance of coupled circuits, Rise and Decay of Current in Inductive circuit.								05
5	AC Circuits: Representation of sinusoidal waveforms, peak and rms values, phasor representation, real power, reactive power, apparent power, power factor. Analysis of single-phase ac circuits consisting of R, L, C, RL, RC, RLC combinations (Series and parallel), resonance. Three phase balanced circuits, voltage and current relations in star and delta connections, measurement of power in 3-phase circuits.								10
6	Transformer: Magnetic materials, BH characteristics, working principle, construction, core and shell type transformer, step up and step down transformer.								04
7	Induction motor: Classification of A.C. motors, construction and working of three-phase motor, production of rotating field, Synchronous speed, Actual speed, Slip.								04

8	Electrical Installations: Components of LT Switchgear: Switch Fuse Unit (SFU), MCB, ELCB, MCCB, Types of wires and Cables, Types of Batteries, Important Characteristics for Batteries, Elementary calculations for energy consumption and power factor improvement.	06
Practical content		
Practicals, assignments and tutorials are based on above syllabus.		
Text Books		
1.	U.A. Patel, "Elements of Electrical & Electronics Engineering", Atul Prakashan.	
2.	B.L. Thereja, "Electrical Technology", S. Chand Volume-I.	
3.	B.L. Thereja, "Electrical Technology", S. Chand Volume-II.	
Reference Books		
1.	V.N. Mittal, "Basic Electrical Engineering", Tata Mc Graw hill, New Delhi.	
2.	V.K. Mehta, "Principles of Power Systems", Pub. By Chand.	
3.	D.P. Kothari and I.J. Nagrath, "Basic Electrical Engineering", Tata McGraw Hill, 2010.	
4.	D.C. Kulshreshtha, "Basic Electrical Engineering", McGraw Hill, 2009.	
5.	L.S. Bobrow, "Fundamentals of Electrical Engineering", Oxford University Press, 2011.	
6.	V.D. Toro, "Electrical Engineering Fundamentals", Prentice Hall India, 1989.	
ICT/MOOCs		
1.	http://www.nptel.ac.in/courses/108105053/ (D.C. Circuits, Capacitor, Magnetic circuit Electromagnetic Induction, AC Circuits, Transformer, Induction motor)	
2.	https://www.youtube.com/watch?v=9XOnqmnKYSg (Battrey and cells)	