

<b>GANPAT UNIVERSITY</b>										
<b>FACULTY OF ENGINEERING AND TECHNOLOGY (DIPLOMA PROGRAMMES)</b>										
Programme		Diploma Engineering				Branch/Spec.		Mechanical / Civil / Automobile Engineering		
Semester		I/II				Version		1.0.0.0		
Effective from Academic Year			2018-19			Effective for the batch Admitted in			June 2018	
Subject code		1ES109		Subject Name		Elements of Electrical Engineering				
Teaching scheme						Examination scheme (Marks)				
(Per week)	Lecture(DT)		Practical(Lab.)		Total		CE	SEE	Total	
	L	TU	P	TW						
Credit	2	0	1	0	3	Theory	40	60	100	
Hours	2	0	2	0	4	Practical	30	20	50	
Pre-requisites:										
None										
Learning Outcome:										
After successful completion of the course, student will be able to										
<ul style="list-style-type: none"> <li>• Explain various terms regarding electric and magnetic circuits</li> <li>• Know various basic theories of transformer and its use in electrical engineering.</li> <li>• Know about various types of dc and ac motors; their construction and working.</li> <li>• Identify various electrical instruments and safety devices.</li> <li>• Know about basic electronic components and colour coding of resistor.</li> </ul>										
Theory syllabus										
Unit	Content								Hrs	
1	<b>Fundamentals of Electric and Magnetic Circuits</b> Definitions of EMF, Current, Potential Difference, Power and Energy. Ohm's law, Study of terms: - M.M.F, magnetic force, magnetic field strength, permeability, reluctance etc. Comparison of magnetic and electric circuit. Magnetic field of permanent magnet and current carrying conductor, Faraday's law of electromagnetic induction, Concept of AC and DC current. Study of AC terms; cycle, instantaneous value, amplitude, frequency, time period, R.M.S. value, average value. Introduction to 3-phase circuits								6	
2	<b>Single Phase Transformer</b> Basic principle, types; core and shell type, construction, ideal transformer, transformation ratio, EMF equation, losses & efficiency, Auto transformer; types, construction, working, applications, advantages, disadvantages								6	
3	<b>Rotating Electrical Machines</b> DC Generator; construction, working, EMF equation, applications, losses and efficiency. DC motor; types, construction, working, applications, speed control of dc motor. 3-phase induction motor; Types, construction, working, applications. 1-phase induction motor; types, construction, working, applications.								8	
4	<b>Electrical Instruments and Safety</b> Types of electrical instruments; voltmeter, ammeter, multimeter, clip-on meter, cathode ray oscilloscope (CRO); connection diagram and applications. Electric shock and safety, protective devices such as Fuse, MCB, ELCB.								4	
5	<b>Electronic Components and Circuits</b> Types of resistor and its colour coding, Energy band diagram, P-type and N-type semiconductor, PN junction diode, transistor, diac, triac, SCR; construction, working and applications, rectifier circuits; half, full and bridge wave.								6	

<b>List of Practical</b>	
1	Verify ohm's law.
2	Demonstrate difference between AC and DC.
3	Identify the various electrical components use in electrical engineering
4	Identify the different parts of transformer.
5	Identify the different parts of dc machines in laboratory.
6	Connect the 1-phase induction motor.
7	Connect the 3-phase induction motor.
8	Use the various electrical instruments for measurement of electrical parameters
9	Use of CRO for measurement of various electrical parameters
10	Perform practical on PN junction diode.
11	Perform practical on rectifier circuit and shown input and output waveforms.
<b>Text Books</b>	
1	A text book of Electrical Technology vol. I & II, B. L. Theraja, S.Chand Publication, New Delhi
<b>Reference Books</b>	
1	Electrical and electronic measurement and instrumentation by A.K. Sawhney
2	Basic electronics by V. K. Mehta, S.Chand Publication, New Delhi

