

GANPAT UNIVERSITY									
FACULTY OF ENGINEERING & TECHNOLOGY									
Programme	Bachelor of Technology				Branch/Spec.	Mechanical Engineering			
Semester	III				Version	2.0.0.0			
Effective from Academic Year	2019-20				Effective form the batch Admitted in	July 2018			
Subject code	2EE3106		Subject Name		<b>Electrical Technology</b>				
Teaching scheme					Examination scheme (Marks)				
(Per week)	Lecture(DT)		Practical(Lab.)		Total		CE	SEE	Total
	L	TU	P	TW					
Credit	4	0	1	0	5	Theory	40	60	100
Hours	4	0	2	0	6	Practical	30	20	50
Pre-requisites:									
<ul style="list-style-type: none"> <li>• Basic Electrical Engineering</li> <li>• Introductory knowledge of electrical and electronics components</li> </ul>									
Learning Outcome:									
<b>After learning this course, student should be able to:</b>									
<ul style="list-style-type: none"> <li>• To understand the construction, operation, working and application of DC machine, Transformer etc.</li> <li>• Students will able to understand the working principal of various motors like DC motor, Induction motor etc.</li> <li>• Will demonstrate the concept of Power generation-transmission and distribution of electric power.</li> <li>• Understand the effect of electrical heating in various machines.</li> <li>• To impart the knowledge on constructional details, principle of operation, type of 1 phase induction motor and special machine.</li> </ul>									
Theory syllabus									
Unit	Content							Hrs	
1	<b>DC Machines :</b> Principle of operation, types, construction, winding, EMF equation, characteristics of DC generators, DC motor operation and types, back EMF, torque, characteristics of motors, speed control of series and shunt motors, DC motor starter.							10	
2	<b>Transformer :</b> Ideal transformer, transformer on no load and on load, phase diagram, equivalent circuit, losses and efficiency, regulation, testing, Auto transformer, CT & PT, Three phase transformer connection.							10	
3	<b>Induction Motor :</b> Torque equation, Torque / slip characteristics, power flow, losses and efficiency, starting of induction motor, Speed control of induction motor,Equivalent circuit of 3-phase induction motor, Single phase induction motor principle, types and construction.							10	
4	<b>Synchronous Machines :</b> Basic operating principle, construction, EMF equation, winding factor, armature reaction, synchronous impedance and equivalent circuit, synchronous motor operation, phase diagram, starting, synchronous condenser.							10	
5	<b>Special electrical machines:</b> Stepper motor, servomotor (DC & AC Servomotors) ,Brushless DC Motors,Switched							04	

	Reluctance Motors.	
5	<b>Electrical Power:</b> Layout of thermal, hydro, nuclear and gas power plant, Single line diagram of power system, Basics of transmission and distribution, Major protective equipment used in power system.	<b>10</b>
6	<b>Heating and Welding :</b> Methods of heat transfer like conduction, convection and radiation, Resistance heating, resistance oven, control equipments, radiant and slot bath heating, Induction heating, arc furnaces. Electric welding, Resistance welding, Arc welding, Welding transformer.	<b>06</b>
<b>Practical content</b>		
The term work shall be based on experimental and analytical work on the topics mentioned above and will be defended by the candidates.		
<b>Text Books</b>		
1	A. K. Theraja & B. L. Thereja, "A Text book of Electrical Technology ( Vol II)", S Chand & Co- 23 <sup>rd</sup> Edition.	
2	V. K. Mehta, "Electrical Power System", S.Chand Publication.	
<b>Reference Books</b>		
1	J. B. Gupta, "Theory and Performance of Electrical Machines", S.K.Kataria and Sons, Reprint 2010.	
2	S. Sivanagaraju, "Electrical Power Transmission and Distribution", Pearson Publishers	
3	S. L. Uppal, "Electrical Power", Khanna publishers, 1988.	
4	P S Bimbhra, "Electrical Machinery", Khanna Publishers	
5	T.J.E Miller, "Brushless permanent magnet and reluctance motor drives", Clarendon Press, Oxford, 1989.	
<b>ICT/MOOCs references</b>		
1	<a href="https://nptel.ac.in/downloads/108105053/">https://nptel.ac.in/downloads/108105053/</a>	
2	<a href="http://www.nptelvideos.in/2012/11/basic-electrical-technology.html">http://www.nptelvideos.in/2012/11/basic-electrical-technology.html</a>	
3	<a href="https://freevideolectures.com/course/2335/basic-electrical-technology">https://freevideolectures.com/course/2335/basic-electrical-technology</a>	
4	<a href="https://nptel.ac.in/courses/108108076/">https://nptel.ac.in/courses/108108076/</a>	