

Subject Code: 1ET1020306	Subject Title:: Electrical Technology
Pre-requisite Subject	Elements of Electrical Engineering.

Course Objective:

This course will help student to

1. Electrical Technology is a subject where a student will learn the generalized theory of machines, which will help then to analyse the machines fundamentals.
2. To make the students familiar with the impact of Electrical Machines operation.

Teaching Scheme (Hours per week)				Evaluation Scheme (Marks)				
Lecture	Tutorial	Practical	Credit	Theory		Practical		Total (T+P)
				University Assessment	Continuous Assessment	University Assessment	Continuous Assessment	
2	-	2	3	70	30	30	20	150

Subject Contents				
Sr. No	Topic	Total Hours	Weight (%)	
1.	D.C. Machine: Constructional features and types of D.C. Machines, Basic Principles, E.m.f., Torque and speed equations, Performance and speed characteristics of series, Shunt compound generators and motors, Speed control and application of motors, starters.	6	25	
2.	Single Phase Transformers: Construction and principle of operation, EMF equations, Equivalent circuit and phasor diagram, OC & SC Test, Regulation and efficiency, Autotransformer, Current transformer, Potential transformer, Parallel operation.	7	25	
3.	Synchronous Machines: Constructional features, Principle of operation, EMF equation of alternator, Regulation of alternator, Synchronizing of alternator, Construction, operation of synchronous motor for power factor improvement, Starting procedure of Synchronous motor.	7	25	
4.	Induction Motor: Constructional features and principle of operation, Starting and running condition, Speed torque characteristics, Starting, Speed control and applications, Single phase motors, Principle of operation, Construction.	9	25	

List of References:

1. Theraja B L, Electrical Technology – Vol II, S Chand Publications
2. Gupta J B, Electrical Machines, S K Kataria Publications
3. Nagrath I J and Kothari D P, Electric Machines, Tata McGraw Hill
4. Ghosh Samarjit, Electrical Machines, Pearson Education
5. Fitzgerald A.E and Kingsley, Electrical Machinery, Tata McGraw

Course Outcome:

The students will be able to

1. The ability to formulate and then analyze the working of any electrical machine under different conditions.
2. The skill to analyze the response of any electrical machine.
3. The ability to troubleshoot the operation of an electrical machine.
4. The ability to select a suitable measuring instrument for a given application.

List of Experiments:

1. To obtain Magnetizing Characteristics, Internal & External Characteristic of Self Excited DC Shunt Generator. Also obtain the critical field resistance of the machine from magnetizing Characteristics.
2. To conduct direct load test on a D.C. Shunt generator.
3. To conduct direct load test on a D.C. Series generator.
4. Speed control of DC Shunt Motor using a) Armature control and b) field control methods.
5. To conduct open circuit and short circuit test on a single phase transformer and determine the equivalent circuit parameters.
6. To perform direct load test on a three phase induction motor to find out its performance parameters at different load conditions.
7. To study about the starters of three phase induction motors.
8. To study the construction of a three phase induction motor with the help of a cut section model.
9. To study the construction of a three phase synchronous motor.