

**Lesson
Plan
(Electrical
Machnie-
I)**

Name of Faculty

Ms. Rajni

Discipline

Electrical Engineering

Semester

4th

:

Subject

Electrical Machine-I

Lesson plan duration

15 weeks (from January 18 to April 18)

Work Load(Lecture/Practical) per week : Lectures-04, Practicals-03

Week	Theory		Practical	
	Lecture Day	Topic(including assignment/test)	Practical day	Topic
1 st	1 st (Unit-1)	<ul style="list-style-type: none"> Will Discuss Learning outcomes of Electrical Machine subject. 	1 st	<ul style="list-style-type: none"> Introduction of EM lab various specifications of Motors safety precautions etc.
	2 st	<ul style="list-style-type: none"> Introduction to Electrical Machines 		
		<ul style="list-style-type: none"> Definition of motor and generator, concept of torque 		
	3 rd	<ul style="list-style-type: none"> Electro-magnetically induced emf. 		
	4 th	<ul style="list-style-type: none"> Torque development due to alignment of two fields and the concept of torque angle 		
2 nd	5 th	<ul style="list-style-type: none"> Elementary concept of an electrical machine 	2 nd	Measurement of the angular displacement of the rotor of a slip-ring induction motor on application of DC to stator of motor winding in sequence and simultaneously to each phase of rotor winding
	6 th	<ul style="list-style-type: none"> Comparison of generator and motor 		
	7 th (Unit-II)	<ul style="list-style-type: none"> Introduction of DC machines, its types 		
	8 th	<ul style="list-style-type: none"> Construction of DC machines 		
3 rd	9 th	<ul style="list-style-type: none"> Armature winding and its types 	3 rd	Speed control of dc shunt motor
	10 th	<ul style="list-style-type: none"> Commutator and its function for generator and motor action 		(i) Armature control method
	11 th	<ul style="list-style-type: none"> Factors determining induced EMF 		(ii) Field control method
	12 th	<ul style="list-style-type: none"> Factors determining electromagnetic torque 		

4 th	13 th	<ul style="list-style-type: none"> DC generator and its types 	4 th	Evaluation of above practical's.
	14 th	<ul style="list-style-type: none"> Voltage buildup in DC gen. 		
	15 th	<ul style="list-style-type: none"> Back emf, its significance , relationship between terminal voltage and back emf 		
	16 th	<ul style="list-style-type: none"> Armature reaction 		
5 th	17 th	<ul style="list-style-type: none"> Commutation methods to improve commutation 	5 th	Study of dc series motor with starter (to operate the motor on no load for a moment)
	18 th	<ul style="list-style-type: none"> Types of DC Motors, its performace, Characteristic of DC motors 		
	19 th	<ul style="list-style-type: none"> Speed control of DC motors, starters for DC motors(3 point and 4 point) 		
	20 th	<ul style="list-style-type: none"> Application of DC Motors, losses in DC machines 		
6 th	21th	<ul style="list-style-type: none"> Swinburne's test to find out losses 	6 th	Study of 3 point starter for starting D.C shunt motor.
		<ul style="list-style-type: none"> First assignment will be given and tentative 1st sessional test/evaluation of sessional marks etc. 		
	22th	<ul style="list-style-type: none"> Display and analysis of sessional marks 		
	23th(unit-3)	<ul style="list-style-type: none"> Introduction of Transformers, types of T/Fm 		
	24 th	<ul style="list-style-type: none"> Construction of single phase transformer, 		
7 th	25 th	<ul style="list-style-type: none"> Parts of a transformer 	7 th	To perform open circuit and short circuit test for determining: (i) equivalent circuit (ii) the regulation and(iii)efficiencyof a transformerfrom the data obtained from open circuit and short circuit test at full load
	26th	<ul style="list-style-type: none"> Working principle of transformer 		
	27 th	<ul style="list-style-type: none"> EMF equation of T/fm 		
	28th	<ul style="list-style-type: none"> Transformer at no load and its phasor diagram 		
8 th	29 th	<ul style="list-style-type: none"> Transformer – neglecting voltage drop in the windings – Ampere turn balance – its phasor diagram 	8 th	Evaluation of above practicals.

	30 th	<ul style="list-style-type: none"> Mutual and leakage fluxes, leakage reactance 		
	31 th	<ul style="list-style-type: none"> Transformer on load, voltage drops and its phasor diagram 		
	32 th	<ul style="list-style-type: none"> Equivalent circuit diagrams of T/fm, Relation between induced emf and terminal voltage, regulation of a transformer mathematical relation 		
9 th	33 th	<ul style="list-style-type: none"> Losses in transformer, various tests OC/SC Test to find out these losses and efficiency etc. 	9 th	Revision of above practicals for left out students.
	34 th	<ul style="list-style-type: none"> Auto transformer, construction, working and its application 		
	35 th	<ul style="list-style-type: none"> Different type of transformer including dry type transformer 		
	36 th	<ul style="list-style-type: none"> second assignment will be given and tentative 2nd sessional test/evaluation of sessional marks etc 		
10 th	37 th	<ul style="list-style-type: none"> display and analysis of sessional marks. 	10 th	Checking the polarity of the windings of a three phase transformer and connecting the windings in various configurations
	38 th (unit-4)	<ul style="list-style-type: none"> construction of 3-phase transformer 		
	39 th	<ul style="list-style-type: none"> accessories of transformers such as Conservator, breather, 		
	40 th	<ul style="list-style-type: none"> Buchholz Relay, Tap Changer (off load and on load) (Brief idea) 		
11 th	41 th	<ul style="list-style-type: none"> Types of three phase transformer i.e. delta-delta, delta-star 	11 th	Finding the voltage and current relationships of primary and secondary of a three phase transformer under balanced load in various configurations conditions such as (a) Star-star (b) Star delta (c) Delta star (d) Delta-Delta configuring conditions
	42 th	<ul style="list-style-type: none"> ..star-delta, star-star. 		
	43 th	<ul style="list-style-type: none"> Parallel operation of transformer, its need 		
	44 th	<ul style="list-style-type: none"> Parallel operation conditions will be discussed 		
12 th	45 th	<ul style="list-style-type: none"> Any left out topic due to CI/leave etc. 	12 th	Evaluation of above practicals.
	46 th	<ul style="list-style-type: none"> Same as above 		
	47 th	<ul style="list-style-type: none"> Local visit to complaint centre to show parts /accessories of transformer 		

	48 th	<ul style="list-style-type: none"> On load/off load tap changer 		
13 th	49 th	<ul style="list-style-type: none"> Distribution /power transformer 	13 th	Revision of above practicals for left out students if any.
	50 th	<ul style="list-style-type: none"> Cooling of transformer 		
	51 th	<ul style="list-style-type: none"> 3rd assignment will be given 		
	52 th	<ul style="list-style-type: none"> Previous state boards question will be carried out, any other left out topic 		
14 th	53 th	<ul style="list-style-type: none"> 3rd sessional test 	14 th	Viva-voce/preparation of practical sessional marks.
	54 th	<ul style="list-style-type: none"> Evaluation of 3rd test 		
	55 th	<ul style="list-style-type: none"> Display/analysis of 3rd sessional test 		
	56 th	<ul style="list-style-type: none"> Remedial will be taken if any shortcomings found 		
15 th	57 th	<ul style="list-style-type: none"> Seminal/group discussion as per evaluation scheme 		
	58 th	<ul style="list-style-type: none"> -do- 		
	59 th	<ul style="list-style-type: none"> -do- 		
	60 th	<ul style="list-style-type: none"> -do- 		
16 th		<ul style="list-style-type: none"> Preparation of sessionals, practical award etc. 		