

GOVT POLYTECHNIC ,GAJAPATI
Department Of Electrical Engineering
LESSON PLAN

Subject : TH:3- AC MACHINES AND SPECIAL ELECTRICAL MACHINES

Name of Faculty:

Sri Deepak Ku Roul,Lect(S-2)

Semester : 4th

Branch : Electrical Engineering

No of period: 45 (3hr /week)

W.E.F :- 22.12.2025

Week	Period	Topic to be covered	Teaching Aid to be use
1		Three Phase Induction Motor	
	1	Working principle: production of rotating magnetic field, Synchronous speed, rotor speed and slip	White board ,Marker, Ref book, notes
	2	Constructional details of 3 phase induction motors: Squirrel cage induction motor and Slip ring induction motor	-do-
	3	Rotor quantities: frequency, induced emf, power factor at starting and running condition	-do-
2	4	Characteristics of torque versus slip (speed), Torques: starting, full load and maximum with relations among them(numerical)	White board ,Marker, Ref book, calculator
	5	Induction motor as a generalized transformer with phasor diagram	-do-
	6	Four quadrant operation, Power flow diagram(numerical)	White board ,Marker, Ref book, calculator
3	7	Starters: need and types; stator resistance, auto transformer, star delta, rotor resistance and soft starters	
	8	Speed control methods: stator voltage, pole changing, rotor resistance and VVVF	-do-
	9	Motor selection for different applications as per the load torque-speed requirements	
4	10	Maintenance of three phase induction motors	White board ,Marker, Ref book, notes
		Single phase Induction Motors	-do-
	11	Double field revolving theory	-do-
	12	Principle of making single phase induction motors self-start	-do-
5	13	Construction and working of single phase induction motors Resistance start induction run Capacitor start induction run	-do-
	14	Capacitor start capacitor run Shaded pole	-do-
	15	Repulsion type Series motor	-do-
6	16	Universal motor Hysteresis motor	-do-
	17	Torque-speed characteristics for all of the above motors.	
	18	Motor selection for different applications as per the load torque- speed requirements	-do-
	19	Maintenance of single phase induction motors	-do-

Week	Period	Topic to be covered	Teaching Aid to be use
07		Three phase Alternators	White board ,Marker, Ref book, notes
	20	Principle of working, moving and stationary armatures	-do-
	21	Constructional details: parts and their functions , Rotor constructions	-do-
08	22	Windings: Single and Double layer	-do-
	23	E.M.F. equation of an Alternator with numerical by considering short pitch factor and distribution factor	-do-
	24	Alternator loading	White board ,Marker, Ref book, notes
09	25	Factors affecting the terminal voltage of alternator Armature resistance and leakage reactance drops	-do-
	26	Armature reaction at various power factors and synchronous impedance	-do-
	27	Voltage regulation: direct loading and synchronous impedance methods	-do-
10	28	Maintenance of alternators	
		Synchronous Motors	
	29	Principle of working /operation, significance of load angle.	White board ,Marker,
	30	Torques: starting torque, running torque, pull in torque, pull out torque	White board ,Marker,
11	31	Synchronous motor on load with constant excitation (numerical)	White board ,Marker, ,ref books ,Calculator
	32	effect of excitation at constant load (numerical). Curves and Inverted V-Curves	
	33	Hunting and Phase swinging	-do-
12	34	Methods of Starting of Synchronous Motor	-do-
	35	Losses in synchronous motors and efficiency (no numerical).	-do-
	36	Applications of Synchronous Motor	
13		Fractional horse power (FHP) Motors	White board ,Marker
	37	Construction and working Synchronous Reluctance Motor	
	38	Switched Reluctance Motor	White board ,Marker, Ref book, notes
	39	BLDC	-do-
14	40	Permanent Magnet Synchronous Motors	White board ,Marker
	41	Stepper motors	White board ,Marker
	42	AC and DC servomotors	White board ,Marker
15	43	Torque speed characteristics of above motors	White board ,Marker
	44	Applications of above motors	
	45	Question Discussion	


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