




GIETPOLYTECHNIC, JAGATPUR, CUTTACK

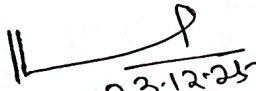
LESSON PLAN

DISCIPLINE:- ELECTRICAL ENGINEERING	SEMESTER:- 4 TH	NAME OF THE TEACHING FACULTY: SUDIPTA KUMAR DAS
SUBJECT TH:3-AC MACHINES AND SPECIAL ELECTRIC MACHINES	NO. OF DAYS/PER WEEK CLASS ALLOTTED:- 3	SEMESTER FROM DATE:- 22-12-2025 TO DATE :-18 -04 -2026 NO. OF WEEK:15
WEEK	CLASS DAY	THEORY
1 st	1 st	UNIT-1:Three Phase Induction Motor 1.1 Working principle: production of rotating magnetic field, Synchronous speed, rotor speed and slip
	2 nd	1.2 Constructional details of 3 phase induction motors: Squirrel cage induction motor and Slip ring induction motor
	3 rd	1.3 Rotor quantities: frequency, induced emf, power factor at starting and running condition
2 nd	1 st	1.4 Characteristics of torque versus slip (speed), Torques: starting, full load and maximum with relations among them(numericals)
	2 nd	1.5 Induction motor as a generalized transformer with phasor diagram
	3 rd	1.6 Four quadrant operation, Power flow diagram(numericals)
3 rd	1 st	1.7 Starters: need and types; stator resistance, auto transformer, star delta, rotor resistance and soft starters
	2 nd	1.8 Speed control methods: stator voltage, pole changing, rotor resistance and VVVF
	3 rd	1.9 Motor selection for different applications as per the load torque-speed requirements
4 th	1 st	1.10 Maintenance of three phase induction motors
	2 nd	UNIT-2:Single phase Induction Motors 2.1 Double field revolving theory
	3 rd	2.2 Principle of making single phase induction motors self-start
5 th	1 st	2.3 Construction and working of single phase induction motors
	2 nd	2.3.1 Resistance start induction run
	3 rd	2.3.2 Capacitor start induction run 2.3.3 Capacitor start capacitor run
6 th	1 st	2.3.4 Shaded pole 2.3.5 Repulsion type
	2 nd	2.3.6 Series motor 2.3.7 Universal motor
	3 rd	2.3.8 Hysteresis motor
7 th	1 st	2.4 Torque-speed characteristics for all of the above motors
	2 nd	2.5 Motor selection for different applications as per the load torque-speed requirements
	3 rd	2.6 Maintenance of single phase induction motors
8 th	1 st	UNIT-3:Three phase Alternator 3.1 Principle of working, moving and stationary armatures
	2 nd	3.2 Constructional details: parts and their functions
	3 rd	3.2.1 Rotor constructions
9 th	1 st	3.2.2 Windings: Single and Double layer
	2 nd	3.3 E.M.F. equation of an Alternator with numerical by considering short pitch factor and distribution factor
	3 rd	3.4. Alternator loading 3.4.1 Factors affecting the terminal voltage of alternator

10 th	1st	3.4.2 Armature resistance and leakage reactance drops.
	2 nd	3.5 Armature reaction at various power factors and synchronous impedance.
	3 rd	3.6 Voltage regulation: direct loading and synchronous impedance Methods 3.7 Maintenance of alternators
11 th	1st	UNIT-4:Synchronous Motors 4.1 Principle of working /operation
	2 nd	4.2 Torques: starting torque ,running torque, pull in torque, pull out tor.que
	3 rd	4.3 Synchronous motor on load with constant excitation (numerical), effect of excitation at constant load (numerical).
12 th	1st	4.4 Curves and Inverted V-Curves.
	2 nd	4.5 Hunting and Phase swinging.
	3 rd	4.6 Methods of Starting of Synchronous Motor
13 th	1st	4.7 Losses in synchronous motors and efficiency (no numerical). 4.8 Applications areas
	2 nd	UNIT-5:Fractional horse power (FHP) Motors 5.1 Construction and working.
	3 rd	5.1.1 Synchronous Reluctance Moto
14 th	1st	5.1.2 Switched Reluctance Motor 5.1.3 BLDC
	2 nd	5.1.4 Permanent Magnet Synchronous Motors 5.1.5 Stepper motors
	3 rd	5.1.6 AC and DC servomotors 5.2 Torque speed characteristics of above motors 5.3 Applications of above motor
15 th	1st	REVISION
	2 nd	REVISION
	3 rd	REVISION


 23.12.25
 Signature of faculty


 23.12.25
 Signature of sr lecturer
 Head of Dept. (HOD)
 Electrical & ETC
 G. J. T. (O. L. Y.)


 23.12.25
 Signature of principal
 Principal
 GIET (Polytechnic)
 Jagatpur, Cuttack