

DEPARTMENT OF ELECTRICAL ENGINEERING
GOVERNMENT POLYTECHNIC, BARGARH



LESSON PLAN

AC MACHINES AND SPECIAL ELECTRICAL MACHINES (TH-3)

4TH. SEMESTER

ELECTRICAL ENGINEERING DEPARTMENT

PREPARED BY

NITESH KUMAR ACHARYA

LECTURER(S-II) (ELECTRICAL ENGG)

GOVERNMENT POLYTECHNIC, BARGARH

Department Of Electrical Engineering

Semester: 4th. DIPLOMA

Session: SUMMER-2026(22.12.2025 to 18.04.2026)

Subject: AC MACHINE & SPL ELECTRICAL MACHINES

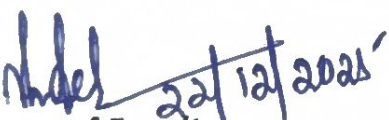
No of Period :-45 (3p/week)

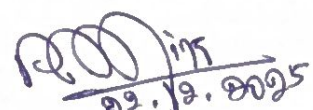
Branch: Electrical Engineering

Name of Faculty: NITESH KU. ACHARYA

Week	Period	Topics to be covered
1 st Week	1	Three Phase Induction Motor- Working principle
	2	Constructional details of 3 phase induction motors: Squirrel cage induction motor and Slip ring induction motor
	3	production of rotating magnetic field, Synchronous speed, rotor speed and slip
2 nd Week	4	Rotor quantities: frequency, induced emf, power factor at starting and running condition
	5	Characteristics of torque versus slip (speed)
	6	Starting torque in 3-phase induction motor & condition for maximum starting torque
3 rd Week	7	Full load torque in 3-phase induction motor & condition for maximum full load torque
	8	Relationship among different torque & numerical
	9	Induction motor as a generalized transformer with phasor diagram
4 th Week	10	Power flow diagram(numerical)
	11	Starters: need and types;stator resistance, auto transformer
	12	star delta, rotor resistance and soft starters starters
5 th Week	13	Speed control methods: stator voltage, pole changing, rotor resistance and VVVF, Maintenance of three phase induction motors
	14	Single phase Induction Motors- Double field revolving theory
	15	Principle of making single phase induction motors self-start
6 th Week	16	Construction and working of single phase induction motors
	17	Resistance start induction run motor, Capacitor start induction run motor, Capacitor start capacitor run motor
	18	Shaded pole motor, Repulsion type motor
7 th Week	19	Series motor, Universal motor
	20	Hysteresis motor, Maintenance of single phase induction motors
	21	Three phase Alternators- Principle of working, moving and stationary armatures
8 th Week	22	Rotor constructions ,Windings: Single and Double layer
	23	E.M.F. equation of an Alternator with numerical by considering short pitch factor
	24	E.M.F. equation of an Alternator with numerical by considering distribution factor
9 th Week	25	Alternator loading, Factors affecting the terminal voltage of alternator
	26	Armature resistance and leakage reactance drops, Armature reaction at various power factors and synchronous impedance
	27	Voltage regulation: direct loading and synchronous impedance methods, Maintenance of alternators

10 th Week	28	Synchronous Motors- Principle of working /operation, significance of load angle
	29	Torques: starting torque, running torque, pull in torque, pull out torque
	30	Synchronous motor on load with constant excitation (numerical)
11 th Week	31	Synchronous motor effect of excitation at constant load (numerical)
	32	V-Curves and Inverted V-Curves
	33	Hunting and Phase swinging
12 th Week	34	Methods of Starting of Synchronous Motor
	35	Losses in synchronous motors and efficiency (no numerical), Applications
	36	Fractional horse power (FHP) Motors- Synchronous Reluctance Motor
13 th Week	37	Switched Reluctance Motor
	38	BLDC motor
	39	Permanent Magnet Synchronous Motors
14 th Week	40	Stepper motors
	41	Stepper motors
	42	AC and DC servomotors
15 th week	43	Model questions & numerical
	44	Model questions & numerical
	45	Model questions & numerical


 Signature of Faculty


 Signature of HOD