LESSON PLAN

DEPT. OF ELECT. ENGG GOVT. POLY, BHADRAK ESTD-2017

SUB: ENERGY CONVERSION - II

BRANCH:- ELECTRICAL ENGG.

SEMESTER: 5th

SESSION:2025-2026

NAME OF FACULTY: NIBEDITA HO

GOVERNMENT POLYTECHNIC, BHADRAK

Hod ,Electrical

HOD (ELECT.)
G.P.BHADRAK

Academic Co-ordinator

Academic Co-ordinator

Principal
Govt. Polytechnic, Bhadrak

Principal
Govt.Polytechnic
Bhadrak

Discipline: Electrical Engg.	Semester: 5th	Name of the Teaching Faculty : Nibedita Ho
Subject: Energy Conversion - II	No. of Days/per week class allotted:4	Semester from date: 14.07.2025 to 15.11.2025 No. of Weeks:15
Week	**Class Day**	**Theory**
1st	1st	Production of rotating magnetic field.
	2nd	Constructional feature of Squirrel cage and Slipring induction motors.
	3rd	Working principles of operation of 3-phaseInduction motor.
	4th	Define slip speed, slip and establish the relationof slip with rotor quantities.
2nd	1st	Derive expression for torque during starting andrunning conditions and derive conditions for maximum torque. (numerical problems)
	2nd	Torque-slip characteristics.relation between fullload torque and starting torque (numerical problems)
	3rd	Establish the relations between Rotor Copperloss, Rotor output and Gross Torque and relationship of slip with rotor copperloss. (numerical problems)
	4th	Methods of starting and different types ofstarters used for three phase Induction motor.
3rd	1st	Explain speed control by Voltage Control, Rotorresistance control, Pole changing, frequency control methods.
	2nd	Plugging as applicable to three phase inductionmotor.
	3rd	Describe different types of motor enclosures.
	4th	Explain principle of Induction Generator and state its applications
4th	1st	Basic working principle of alternator and therelation between speed and frequency
	2nd	Terminology in armature winding and expressions for winding factors (Pitch factor, Distributionfactor).
	3rd	Explain harmonics, its causes and impact on winding factor.
	4th	E.M.F equation of alternator. (Solve numericalproblems).
5th	1st	Armature reaction and its effect on emf at different power factor of load.
	2nd	The vector diagram of loaded alternator.(numerical

		problems)
	3rd	Open circuit test of alternator
	4th	Short circuit test of alternator
6th	1st	Determination of voltage regulation of Alternatorby direct loading and synchronous impedance method. (Solve numerical problems)
	2nd	Parallel operation of alternator using synchro-scope and dark & bright lamp method.
	3rd	Distribution of load by parallel connectedalternators.
	4th	Constructional feature of Synchronous Motor
7th	1st	Principles of operation, concept of load angle
	2nd	Derive torque, power developed.
	3rd	Effect of varying load with constant excitation.
	4th	Effect of varying excitation with constant load.
8th	1st	Effect of varying excitation with constant load.
	2nd	Power angle characteristics of cylindrical rotormotor.
	3rd	Power angle characteristics of cylindrical rotormotor.
	4th	Explain effect of excitation on Armature currentand power factor.
9th	1st	Explain effect of excitation on Armature currentand power factor.
	2nd	Hunting in Synchronous Motor
	3rd	Function of Damper Bars in synchronous motorand generator.
	4th	Describe method of starting of Synchronousmotor.
10th	1st	State application of synchronous motor.
	2nd	Ferrari's principle.
	3rd	Double revolving field theory and Cross-fieldtheory to analyze starting torque of 1-phase induction motor.
	4th	Working principle, Torque speed characteristics,performance characteristics and application of Split phase motor
	1st	Working principle, Torque speed characteristics, performance characteristics and application of Capacitor

11th		Start motor.
	2nd	Working principle, Torque speed characteristics, performance characteristics and application of Capacitor start, capacitor run motor.
	3rd	Working principle, Torque speed characteristics, performance characteristics and application of Permanent capacitor type motor.
	4th	Working principle, Torque speed characteristics, performance characteristicsand application of Shaded pole motor.
12th	1st	Method to change the direction of rotation ofabove motors.
	2nd	Construction, working principle, running characteristic and application of single phase series motor.
	3rd	Construction, working principle and application ofUniversal motors.
	4th	Working principle of Repulsion start Motor,
13th	1st	Working principle of Repulsion start Induction runmotor.
	2nd	Working principle of Repulsion Induction motor.
	3rd	Principle of Stepper motor.Classification of Stepper motor.
	4th	Principle of variable reluctant stepper motor.
14th	1st	Principle of Permanent magnet stepper motor.
	2nd	Principle of hybrid stepper motor.
	3rd	Applications of Stepper motor.
	4th	Construction of Core type,shell type transformer
15th	1st	Grouping of winding, Advantages
	2nd	parallel operation of the three phasetransformers.
	3rd	tap changer (On/Off load tap changing)
	4th	Maintenance Schedule of Power Transformers.

Signature of the faculty Concerned

Lect.in Elect.Engg.
Govt.Poly.Bhadrak