"PVC" NSSK Govt. Polytechnic Bilaspur at Kalol
Lecture Planning (Theory)

Branch : **Electrical Engg.**

Semester: **5th**

Subject : **Electrical Machines-III**

Session: **Aug 23 - Dec 23**

Teacher : **Ashwani Kumar**

Cass Room : **L5**

Sr. No.	No. of Lectures	Chapter/ Unit Description	Detail of Contents	Reference Resources	Rem
1.	1-17	Three Phase Induction Motors	Constructional features of squirrel cage and wound rotor induction motors, Comparison of cage and wound rotor Induction motors, Production of rotating magnetic field in a three phase winding, Principle of operation of induction motor, slip, significance of slip, Effect of slip on various parameters of rotor circuit: rotor resistance, rotor inductance, rotor current, rotor frequency, Torque developed in 3-phase induction: starting torque, condition for maximum torque, running torque and maximum toque, Torque-slip and torque-speed curve, Effect of rotor resistance upon torque slip relationship of slip ring induction motor, Starting of 3-phase induction motors using DOL, Star-delta and Autotransformer, Speed control methods of 3-phase induction motor, Testing of 3-phase motor on no load and blocked rotor test to find Efficiency, Effect of induction motors on system power factor, Double cage rotor induction motor and its applications, Applications of induction motors.	R1,R2,R3	
2.	18-34	Synchronous Generator (Alternator)	Construction Feature of synchronous machine, salient and cylindrical type rotor synchronous machine, comparison between salient and cylindrical rotor machine, Advantages of rotating field system, Different types of excitation system for synchronous machine: dc excitation system, static excitation system and brushless excitation system, EMF equation of alternator, Concentrated and distributed windings, Concept of distribution factor and coil span factor and pitch factor. Effect of armature reaction on terminal voltage, Concept of synchronous reactance and synchronous impedance, Phasor diagram of alternator on load: Resistive, inductive and Capacitive load, Effect of power factor on the terminal voltage of alternator, Voltage regulation of alternator, determination of voltage regulation using synchronous impedance method, Need and necessary conditions for parallel operation of alternators. Synchronization of alternators with bus bars using Synchroscope method and lamps method.	-do-	

3.	35-48	Synchronous Motor	Introduction: Construction, operating principle, Starting methods of synchronous motor, Equivalent circuit diagram of synchronous motor, Effect of change in excitation of a synchronous motor, V-curve of synchronous motor, Concept of hunting, causes and prevention of hunting in Synchronous Motor, Applications of synchronous motor as synchronous condense and other applications of synchronous motor.	-do-
4.	49-59	Single Phase Motors	Production of rotating field in 1-phase induction motor: double field revolving theory and cross field theory, Operating Principle, Constructional features and applications of Split–phase, capacitor start, capacitor-start capacitor-run, and Shaded Pole motors, Reluctance Motor: Construction, working principle & Applications, Hysteresis Motor: Construction, working principle & applications. Universal Motor: Construction, working principle & applications.	-do-
5.	60-64	Special Purpose Motors	Linear Induction Motor & Permanent Magnet Brushless DC Motor (Only working principle and applications), Servo Motor (AC and DC) & Stepper Motor (Only working principle).	-do-

08/08/23

Signature of Teacher with Date

Signature of OIC (EE)

Reference Resource:

R1: Electrical Machines by S K Bhattacharya, McGraw Hill, New Delhi.

R2: Electrical Machines by S K Sahdev, Unique International Publications, Jalandhar.

R3: Electrical Engineering by JB Gupta, S K Kataria and Sons, New Delhi.