Lesson Plan

Subject :- EC-II (Code) TH-2 Name of faculty:- Sujata Samal

Semester :-5th Class allotted 4p/w Branch :- Electrical engg

Discipline	Semester:-5th	From date:-14/07/2025 Todate:15/11/2025	Teaching Aid
Subject:	No. of days/ per week 4p/w	Theory/ Practical –Topics/Lesson	
Week	Date/Period		
1	14/07/2025 to 19/07/2025	***PART :*** 1. ALTERNATOR: 1.1. Types of alternator and their constructional features. 1.2. Basic working principle of alternator and the relation between speed and frequency. 1.3. Terminology in armature winding and expressions for winding factors (Pitch factor, Distribution factor).	White board & marker
2	21/07/2025 to 26/07/2025	1.4. Explain harmonics, its causes and impact on winding factor. 1.5. E.M.F equation of alternator. (Solve numerical problems). 1.6. Explain Armature reaction and its effect on emf at different power factor of load. 1.7. The vector diagram of loaded alternator. (Solve numerical problem	White board & marker
3	28/07/2025 to 02/08/2025	1.8. Testing of alternator (Solve numerical problems) 1.8.1. Open circuit test. 1.8.2. Short circuit test. 1.9. Determination of voltage regulation of Alternator by direct loading and synchronous impedance method. (Solve numerical problems) 1.10. Parallel operation of alternator using synchro-scope and dark & bright lamp method. 1.11. Explain distribution of load by parallel connected alternators.	White board & marker
4	04/08/2025 to 09/08/2025	2. SYNCHRONOUS MOTOR: 2.1. Constructional feature of Synchronous Motor. 2.2. Principles of operation, concept of load angle 2.3. Derive torque, power developed. 2.4. Effect of varying load with constant excitation. 2.5. Effect of varying excitation with constant load.	White board & marker

		2.6. Power angle characteristics of cylindrical rotor motor. 2.7. Explain effect of excitation on Armature current and power factor. 2.8. Hunting in Synchronous Motor. 2.9. Function of Damper Bars in synchronous motor and generator. 2.10. Describe method of starting of Synchronous motor. 2.11. State application of synchronous motor.	
5	11/08/2025 to 16/08/2025	3. THREE PHASE INDUCTION MOTOR: 3.1. Production of rotating magnetic field. 3.2. Constructional feature of Squirrel cage and Slip ring induction motors. 3.3. Working principles of operation of 3-phase Induction motor. 3.4. Define slip speed, slip and establish the relation of slip with rotor quantities. 3.5. Derive expression for torque during starting and running conditions and derive conditions for maximum torque. (solve numerical problems)	White board & marker
6	18/08/2025 to 23/08/2025	3.6. Torque-slip characteristics. 3.7. Derive relation between full load torque and starting torque etc. (solve numerical problems)	White board & marker
7	25/08/2025 to 30/08/2025	3.8. Establish the relations between Rotor Copper loss, Rotor output and Gross Torque and relationship of slip with rotor copper loss. (solve numerical problems) 3.9. Methods of starting and different types of starters used for three phase Induction motor.	White board & marker
8	01/09/2025 to 06/09/2025	3.10. Explain speed control by Voltage Control, Rotor resistance control, Pole changing, frequency control methods. 3.11. Plugging as applicable to three phase induction motor.	White board & marker
9	08/09/2025 to 13/09/2025	3.12. Describe different types of motor enclosures. 3.13. Explain principle of Induction Generator and state its applications.	White board & marker
10	15/09/2025 to 20/09/2025	4. SINGLE PHASE INDUCTION MOTOR: 4.1. Explain Ferrari's principle. 4.2. Explain double revolving field theory and Cross-field theory to analyze starting torque of 1-phase induction motor. 4.3. Explain Working principle, Torque speed characteristics, performance characteristics and application of following single phase motors.	White board & marker

11	22/09/2025 to 27/09/2025	4.3.1. Split phase motor. 4.3.2. Capacitor Start motor. 4.3.3. Capacitor start, capacitor run motor. 4.3.4. Permanent capacitor type motor 4.3.5. Shaded pole motor. 4.4. Explain the method to change the direction of rotation of above motors	White board & marker
12	08/10/2025 to 11/10/2025	5. COMMUTATOR MOTORS: 5.1. Construction, working principle, running characteristic and application of single phase series motor.	White board & marker & smart board
13	13/10/2025 to 18/10/2025	5.2. Construction, working principle and application of Universal motors. 5.3. Working principle of Repulsion start Motor, Repulsion start Induction run motor, Repulsion Induction motor	White board & marker
14	20/10/2025 to 25/10/2025	6. SPECIAL ELECTRICAL MACHINE: 6.1. Principle of Stepper motor. 6.2. Classification of Stepper motor. 6.3. Principle of variable reluctant stepper motor.	White board & marker
15	27/10/2025 to 01/11/2025	6.4. Principle of Permanent magnet stepper motor. 6.5. Principle of hybrid stepper motor. 6.6. Applications of Stepper motor	White board & marker & smart board
16	03/11/2025 to 08/11/2025	7. THREE PHASE TRANSFORMERS: 7.1. Explain Grouping of winding, Advantages. 7.2. Explain parallel operation of the three phase transformers.	White board & marker
17	10/11/2025 to 15/11/2025	7.3. Explain tap changer (On/Off load tap changing) 7.4. Maintenance Schedule of Power Transformers 7.3. Explain tap changer (On/Off load tap changing) 7.4. Maintenance Schedule of Power Transformers	White board & marker

Signature of HOD Signature of faculty