

DEPARTMENT OF ELECTRICAL ENGINEERING
GOVERNMENT POLYTECHNIC, BARGARH



LESSON PLAN
AC MACHINE LAB
4th SEMESTER
ELECTRICAL ENGINEERING
PREPARED BY
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LECTURER STAGE II (ELECTRICAL)

DEPARTMENT OF ELECTRICAL ENGINEERING

VISION:

To produce Electrical Engineer professionals who can contribute for socio-economic and technological development to meet global needs.

MISSION:

M1 - To strengthen academic infrastructure leading to quality professional by using modern technical tools and technologies.

M2 - To impart innovative knowledge among the students and make more industry-institution programs to make them successful professionals for serving the society.

M3 - To provide a learning environment to improve problem solving abilities, leadership abilities, ethical responsibilities and lifelong learning.

PROGRAM EDUCATIONAL OBJECTIVES (PEOS)

PEO1: Apply electrical engineering knowledge and practical skills to solve well-defined engineering problems using modern tools and techniques.

PEO2: Perform effectively in industry and society as competent junior engineer, supervisors, or entrepreneurs with ethical and sustainable engineering practices.

PEO3: Demonstrate teamwork, communication, leadership, and project management skills in professional engineering activities.

PEO4: Engage in lifelong learning and adapt to emerging technologies for career growth and higher education.

PROGRAM SPECIFIC OUTCOMES

The electrical diploma engineers will be able to:

PSO1:-Apply the fundamentals of mathematics, science and engineering knowledge to identify, formulate, design and investigate engineering problems of electric circuits, analog and digital electronics, control system, electrical machines and power system.

PSO2:- Apply the appropriate techniques and modern engineering hardware and software tools in electrical engineering to engage in life-long learning and to successfully adapt in multidisciplinary environments.

PSO3:-Work professionally in power systems engineering, Electrical machinery and electrical circuit.

Week No	Class No.	Topics / Experiment to be Covered
1	—	Introduction to Laboratory, Safety Precautions, Syllabus Discussion and Familiarization with Equipment
2	1	Identify the different parts (along with functions and materials) of single-phase and three-phase induction motors.
3	2	Connect and run the three-phase squirrel cage induction motor using DOL, Star-Delta and Auto-transformer starters (any two).
4	3	Perform the direct load test on the three-phase squirrel cage induction motor and plot efficiency, power factor, current and torque-slip characteristics.
5	4	Conduct No-load and Blocked Rotor tests on the three-phase squirrel cage induction motor and determine equivalent circuit parameters.
6	5	Control the speed of the three-phase squirrel cage/slip-ring induction motor using Auto-transformer and VVVF methods.
7	6	Conduct the direct load test on the single-phase induction motor and determine efficiency and speed regulation.
8	7	Perform the direct loading test on the three-phase alternator and determine voltage regulation and efficiency.
9	8	Determine the regulation and efficiency of the three-phase alternator using OC and SC tests (Synchronous Impedance Method).
10	9	Conduct the V-curve and Inverted V-curve tests on the three-phase synchronous motor.
11	10	Dismantle and reassemble single-phase motors (ceiling fan motor and universal motor).
12	11	Control the speed and reverse the direction of the stepper motor.
13	12	Control the speed and reverse the direction of the AC servo motor.
14	13	Control the speed and reverse the direction of the DC servo motor.
15	—	Record Verification, Viva-Voce and Discussion of Experimental Results.