

DEPARTMENT OF ELECTRICAL ENGINEERING
GOVERNMENT POLYTECHNIC, BARGARH



LESSON PLAN

GENERATION TRANSMISSION & DISTRIBUTION (TH 4)

4TH SEMESTER

ELECTRICAL ENGINEERING

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

Week

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Week	Class No.	Unit	Topic
Week 1	1	Unit 1	Introduction to Power System and Generation of Electricity
	2	Unit 1	Thermal Power Plant – Principle and Layout
	3	Unit 1	Hydel Power Plant – Principle and Layout
	4	Unit 1	Nuclear Power Plant – Principle and Layout
Week 2	5	Unit 1	Solar Power Plant and Photovoltaic Cells
	6	Unit 1	Comparison of Thermal, Hydel, Nuclear and Solar Plants
	7	Unit 1	Layout Diagrams of Generating Stations
	8	Unit 1	Tutorial and Numerical Problems
Week 3	9	Unit 2	Layout of Transmission and Distribution Scheme
	10	Unit 2	Voltage Regulation of Transmission Lines
	11	Unit 2	Efficiency of Transmission Lines
	12	Unit 2	Kelvin's Law for Economical Conductor Size
Week 4	13	Unit 2	Corona in Transmission Lines
	14	Unit 2	Corona Loss and Factors Affecting Corona
	15	Unit 2	Numerical Problems on Transmission Lines
	16	Unit 2	Revision and Class Test
Week 5	17	Unit 3	Overhead Lines – Introduction and Components
	18	Unit 3	Types of Supports Used in Overhead Lines
	19	Unit 3	Conductors: Types, Materials and Properties
	20	Unit 3	Size and Spacing of Conductors
Week 6	21	Unit 3	Insulators – Types and Applications
	22	Unit 3	Cross Arms and Line Accessories
	23	Unit 3	Sag in Overhead Lines (Supports at Same Level)
	24	Unit 3	Sag in Overhead Lines (Supports at Different Levels)
Week 7	25	Unit 3	Effect of Wind, Ice and Temperature on Sag
	26	Unit 3	Numerical Problems on Sag Calculation
	27	Unit 4	Performance of Short Transmission Lines
	28	Unit 4	Regulation and Efficiency Calculations
Week 8	29	Unit 5	Introduction to EHV Transmission
	30	Unit 5	EHV AC Transmission – Need and Advantages
	31	Unit 5	Problems Involved in EHV Transmission
	32	Unit 5	Introduction to HVDC Transmission
Week 9	33	Unit 5	Advantages of HVDC Transmission
	34	Unit 5	Limitations of HVDC Transmission
	35	Unit 5	Comparison of EHV AC and HVDC Systems
	36	Unit 5	Tutorial and Numerical Problems
Week 10	37	Unit 6	Introduction to Distribution Systems
	38	Unit 6	Radial Distribution System
	39	Unit 6	Ring Main Distribution System
	40	Unit 6	Interconnected Distribution System
Week 11	41	Unit 6	DC Distribution – Distributor Fed at One End
	42	Unit 6	DC Distribution – Distributor Fed at Both Ends
	43	Unit 6	Ring Distributor System
	44	Unit 6	AC Distribution System – Introduction
Week 12	45	Unit 6	Methods of Solving AC Distribution Problems
	46	Unit 6	Three-Phase Four-Wire Star Connected System

Week 13	47	Unit 7	Underground Cables – Introduction
	48	Unit 7	Cable Insulation and Classification
	49	Unit 7	LT and HT Cables – Constructional Features
	50	Unit 7	Methods of Cable Laying
	51	Unit 7	Cable Faults and Their Causes
	52	Unit 7	Murray Loop Test and Varley Loop Test
Week 14	53	Unit 8	Causes of Low Power Factor
	54	Unit 8	Methods of Power Factor Improvement
	55	Unit 8	Load Curves, Demand Factor and Maximum Demand
	56	Unit 8	Load Factor, Diversity Factor and Plant Capacity Factor
Week 15	57	Unit 8	Peak Load and Base Load on Power Stations
	58	Unit 9	Types of Tariff: Flat Rate, Block Rate, Two-Part and Maximum Demand Tariff
	59	Unit 10	LT, HT and EHT Substations – Layout and C
	60	Unit 10	