GOVERNMENT POLYTECHNIC, MALKANGIRI

DEPARTMENT OF MECHANICAL ENGINEERING

LESSON PLAN

	Discipline: **Mechanical Engineering**	Semester: 6th	Name of the Teaching Faculty: **CHINMAYA BRAHMADARSHI MISHRA**
	Subject: **POWER STATION ENGINEERING**	No. of days/week class allotted 4	Semester From date:22.12.2025 To date:18.04.2026 No. of Week: 15
	PRE-REQUISITE	POWER STATION ENGINEERING	
	Course Outcomes	1.Understand the generation of power by utilizing various energy sources. 2.Understand the use of steam, its operation in thermal power stations 3. Understand the nuclear energy sources and power developed in nuclear power station. 4. Understand the basics of diesel electric power station and hydroelectric power station. 5. Understand the basics of gas turbine power station	

	Week	Class Day	Theory/Practical Topics
	1st	1st	INTRODUCTION: Describe sources of energy.
		2nd	Explain concept of Central and Captive power station.
		3rd	Classify power plants.
		4th	Importance of electrical power in day today life.
	2nd	1st	Overview of method of electrical power generation.
		2nd	THERMAL POWER STATIONS: Layout of steam power stations
		3rd	Steam power cycle. Explain Carnot vapour power cycle with P-V, T-s diagram and determine thermal efficiency
		4th	Steam power cycle. Explain Carnot vapour power cycle with P-V, T-s diagram and determine thermal efficiency
	3rd	1st	Explain Rankine cycle with P-V, T-S & H-s diagram and determine thermal efficiency, Work done, work ratio, and specific steam Consumption
		2nd	Explain Rankine cycle with P-V, T-S & H-s diagram and determine thermal efficiency, Work done, work ratio, and specific steam Consumption
		3rd	Explain Rankine cycle with P-V, T-S & H-s diagram and determine thermal efficiency, Work done, work ratio, and specific steam Consumption
		4th	Solve Simple Problems
	4th	1st	List of thermal power stations in the state with their capacities
		2nd	Boiler Accessories: Operation of Air pre heater, Operation of Economiser, Operation Electrostatic precipitator and Operation of super heater
		3rd	Need of boiler mountings and operation of boiler
		4th	Draught systems (Natural draught, Forced draught & balanced draught) with their advantages & disadvantages
	5th	1st	Steam prime movers: Advantages & disadvantages of steam turbine, Elements of steam turbine
		2nd	governing of steam turbine. Performance of steam turbine: Explain Thermal efficiency
		3rd	Stage efficiency and Gross efficiency
		4th	Steam condenser: Function of condenser, Classification of condenser
	6th	1st	function of condenser auxiliaries such as hot well, condenser extraction pump
		2nd	function of condenser auxiliaries such as hot well, condenser extraction pump
		3rd	air extraction pump, and circulating pump
		4th	Cooling Tower: Function and types of cooling tower, and spray ponds
	7th	1st	Selection of site for thermal power stations
		2nd	NUCLEAR POWER STATIONS: Classify nuclear fuel (Fissile & fertile material)
		3rd	NUCLEAR POWER STATIONS: Classify nuclear fuel (Fissile & fertile material)
		4th	Explain fusion and fission reaction
	8th	1st	Explain working of nuclear power plants with block diagram
		2nd	Explain the working and construction of nuclear reactor
		3rd	Compare the nuclear and thermal plants
		4th	Explain the disposal of nuclear waste

	9th	1st	Selection of site for nuclear power stations
		2nd	List of nuclear power stations
		3rd	List of nuclear power stations
		4th	DIESEL ELECTRIC POWER STATIONS: State the advantages and disadvantages of diesel electric power stations
	10th	1st	Explain briefly different systems of diesel electric power stations: Fuel storage and fuel supply system
		2nd	Fuel injection system, Air supply system, Exhaust system, cooling system
		3rd	Lubrication system, starting system, governing system
		4th	Lubrication system, starting system, governing system
	11th	1st	Lubrication system, starting system, governing system
		2nd	Selection of site for diesel electric power stations
		3rd	Selection of site for diesel electric power stations
		4th	Performance and thermal efficiency of diesel electric power stations
	12th	1st	Performance and thermal efficiency of diesel electric power stations
		2nd	HYDEL POWER STATIONS: State advantages and disadvantages of hydroelectric power plant
		3rd	Classify and explain the general arrangement of storage type hydroelectric project and explain its operation
		4th	Classify and explain the general arrangement of storage type hydroelectric project and explain its operation
	13th	1st	Selection of site of hydel power plant
		2nd	List of hydro power stations with their capacities and number of units in the state
		3rd	List of hydro power stations with their capacities and number of units in the state
		4th	Types of turbines and generation used
	14th	1st	Types of turbines and generation used
		2nd	Simple problems
		3rd	Simple problems
		4th	GAS TURBINE POWER STATIONS: Selection of site for gas turbine stations
	15th	1st	GAS TURBINE POWER STATIONS : Selection of site for gas turbine stations
		2nd	Fuels for gas turbine
		3rd	Elements of simple gas turbine power plants
		4th	Merits, demerits and application of gas turbine power plants

Learning Resources:

1. R.K Rajput Laxmi Publication - Power Plant Engineering
2. P.K.NAG TMH publication - Power Plant Engineering
3. Nag pal G,R Khanna Publisher - Power Plant Engineering
4. P.C.SHARMA S.K KATARIA &SONS Publisher - Power Plant Engineering

Chinmaya Brahmadarshi Mishra

Signature of Faculty

Signature of HOD/

Signature of Academic Coordinator

Signature of Principal