

GOVERNMENT POLYTECHNIC, MALKANGIRI
DEPARTMENT OF MECHANICAL ENGINEERING

LESSON PLAN

LESSON PLAN		
Discipline: Mechanical Engineering	Semester: 6TH	Name of the Teaching Faculty: Shantanu Kumar Maity
Subject: Power Station Engineering	No. of days/week class allotted 4	Semester From date:04.02.2025 No. of Week: 15 To date:17.05.2025
PRE-REQUISITE	Basic Knowledge about Power Station Engineering	
Course Outcomes	CO1: Understand the generation of power by utilizing various energy sources CO2: Understand the use of steam, it's operation in the thermal power plant CO3: Understand the nuclear energy sources and power developed in stations CO4: Understand the basics of diesel electric power station and hydroelectric stations CO5: Understand the basics of gas turbine power stations	
Week	Class Day	Theory/Practical Topics
1st	1st	Describe sources of energy.
	2nd	Overview of method of electrical power generation.
	3rd	Classify power plants, Importance of electrical power in day today life
	4th	Classify power plants, Importance of electrical power in day today life
2nd	1st	Overview of method of electrical power generation.
	2nd	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	Explain Rankine cycle with P-V, T-S & H-s diagram and determine thermal efficiency, Work done, work ratio, and specific steam Consumption
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	Solve Simple Problems.
	3rd	Solve Simple Problems.
	4th	List of thermal power stations in the state with their capacities

	1st	Boiler Accessories: Operation of Air pre heater, Economiser, Electrostatic precipitator and super heater. Need of boiler mountings and operation of boiler.
4th	2nd	Boiler Accessories: Operation of Air pre heater, Economiser, Electrostatic precipitator and super heater. Need of boiler mountings and operation of boiler.
	3rd	Draught systems (Natural draught, Forced draught & balanced draught) with their advantages & disadvantages.
	4th	Draught systems (Natural draught, Forced draught & balanced draught) with their advantages & disadvantages.
	1st	Steam prime movers: Advantages & disadvantages of steam turbine,.
5th	2nd	Elements of steam turbine, governing of steam turbine
	3rd	Performance of steam turbine: Explain Thermal efficiency, Stage efficiency and Gross efficiency.
	4th	Performance of steam turbine: Explain Thermal efficiency, Stage efficiency and Gross efficiency.
	1st	Steam condenser:Function of condenser, Classification of condenser. function of condenser auxiliaries such as hot well, condenser extraction pump, air extraction pump, and circulating pump.
6th	2nd	Steam condenser:Function of condenser, Classification of condenser. function of condenser auxiliaries such as hot well, condenser extraction pump, air extraction pump, and circulating pump.
	3rd	Steam condenser:Function of condenser, Classification of condenser. function of condenser auxiliaries such as hot well, condenser extraction pump, air extraction pump, and circulating pump.
	4th	Cooling Tower: Function and types of cooling tower, and spray ponds , Selection of site for thermal power stations.
	1st	Cooling Tower: Function and types of cooling tower, and spray ponds , Selection of site for thermal power stations.
7th	2nd	Classify nuclear fuel (Fissile & fertile material)
	3rd	Explain fusion and fission reaction
	4th	Explain fusion and fission reaction
	1st	Explain working of nuclear power plants with block diagram.
8th	2nd	Explain working of nuclear power plants with block diagram.
	3rd	Explain the working and construction of nuclear reactor
	4th	Explain the working and construction of nuclear reactor
	1st	Compare the nuclear and thermal plants.
9th	2nd	Explain the disposal of nuclear waste.

	3rd	Selection of site for nuclear power stations and List of nuclear power stations
	4th	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, Fuel injection system, Air supply system, Exhaust system, cooling system, Lubrication system, starting system,.
	2nd	Explain briefly different systems of diesel electric power stations: Fuel storage and fuel supply system, Fuel injection system, Air supply system, Exhaust system, cooling system, Lubrication system, starting system,.
	3rd	Explain briefly different systems of diesel electric power stations: Fuel storage and fuel supply system, Fuel injection system, Air supply system, Exhaust system, cooling system, Lubrication system, starting system,.
	4th	Explain briefly different systems of diesel electric power stations: Fuel storage and fuel supply system, Fuel injection system, Air supply system, Exhaust system, cooling system, Lubrication system, starting system,.
11th	1st	Explain briefly different systems of diesel electric power stations: Fuel storage and fuel supply system, Fuel injection system, Air supply system, Exhaust system, cooling system, Lubrication system, starting system,.
	2nd	Explain briefly different systems of diesel electric power stations: Fuel storage and fuel supply system, Fuel injection system, Air supply system, Exhaust system, cooling system, Lubrication system, starting system,.
	3rd	governing system ,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	State advantages and disadvantages of hydroelectric power plant.
	3rd	State advantages and disadvantages of hydroelectric power plant.
	4th	Classify and explain the general arrangement of storage type hydroelectric project and explain its operation
13th	1st	Classify and explain the general arrangement of storage type hydroelectric project and explain its operation
	2nd	Classify and explain the general arrangement of storage type hydroelectric project and explain its operation

	3rd	Selection of site of hydel power plant and List of hydro power stations with their capacities and number of units in the state.
	4th	Selection of site of hydel power plant and List of hydro power stations with their capacities and number of units in the state.
14th	1st	Types of turbines and generation used
	2nd	Simple problems
	3rd	Simple problems
	4th	Selection of site for gas turbine stations
15th	1st	Fuels for gas turbine
	2nd	Elements of simple gas turbine power plants
	3rd	Elements of simple gas turbine power plants
	4th	Merits, demerits and application of gas turbine power plants.

Learning Resources:

R.K Rajput Power plant engineering (Laxmi Publication)
P.K. Nag Power plant engineering (TMH)
Nag pal G,R Power plant engineering (Khanna Publisher)

Shantanu Kumar Maity
Signature of Faculty

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Signature of Academic Coordinator
06/02/2025

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Signature of Principal