

**UTKALMANI GOPABANDHU INSTITUTE OF ENGINEERING,
ROURKELA**



LESSON PLAN

SESSION-2024-25

SUBJECT: POWER STATION ENGINEERING (THEORY-03)

**DEPARTMENT OF
MECHANICAL ENGINEERING**

Discipline: Mechanical Engineering	Semester: 6th	Name of the Teaching Faculty: Er SISIR KUMAR DALAI
Subject: Power Station Engineering (Th-3)	No of Days/Week Class Allotted: 04	Semester starts From Date: 04.02.2025 to Date: 17.05.2025 No. Of Weeks: 15
Week	Class/Day	Theory/Practical Topics
1st	1st	1.0 INTRODUCTION: Describe sources of energy.
	2nd	Explain concept of Central and Captive power station.
	3rd	Classify power plants.
2nd	1st	Importance of electrical power in day today life.
	2nd	Overview of method of electrical power generation.
3rd	1st	2.0 THERMAL POWER STATIONS: Layout of steam power stations.
	2nd	Steam power cycle. Explain Carnot vapour power cycle with P-V, T-s diagram and determine thermal efficiency.
	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	1st	Solve Simple Problems.
	2nd	Solve Simple Problems.
5th	1st	List of thermal power stations in the state with their capacities.
	2nd	Boiler Accessories: Operation of Air pre heater, Operation of Economiser
	3rd	Operation Electrostatic precipitator and Operation of super heater.
	4th	Need of boiler mountings and operation of boiler.
6th	1st	Draught systems (Natural draught, Forced draught & balanced draught)
	2nd	Advantages & disadvantages.
	3rd	Steam prime movers: Advantages & disadvantages of steam turbine.
	4th	Elements of steam turbine.
7th	1st	Governing of steam turbine.
	2nd	Performance of steam turbine: Explain Thermal efficiency, Stage efficiency and Gross efficiency.
	3rd	Steam condenser: Function of condenser
	4th	Classification of condenser.
8th	1st	Function of condenser auxiliaries such as hot well.
	2nd	condenser extraction pump,
	3rd	air extraction pump, and circulating pump.
9th	1st	Cooling Tower: Function and types of cooling tower.
	2nd	spray ponds
	3rd	Selection of site for thermal power stations.
10th	1st	3.0 NUCLEAR POWER STATIONS: Classify nuclear fuel (Fissile & fertile material)
	2nd	Explain fusion and fission reaction.
	3rd	Explain working of nuclear power plants with block diagram.
11th	1st	Explain the working and construction of nuclear reactor.

		Compare the nuclear and thermal plants.
	2 nd	Explain the disposal of nuclear waste.
	3 rd	Selection of site for nuclear power stations, List of nuclear power stations.
	4 th	4.0 DIESEL ELECTRIC POWER STATIONS: State the advantages and disadvantages of diesel electric power stations.
12 th	1 st	Explain briefly different systems of diesel electric power stations: Fuel storage and fuel supply system, Fuel injection system.
	2 nd	Air supply system, Exhaust system, cooling system, Lubrication system, starting system, governing system.
	3 rd	Selection of site for diesel electric power stations.
	4 th	Performance and thermal efficiency of diesel electric power stations.
13 th	1 st	5.0 HYDEL POWER STATIONS: State advantages of hydroelectric power plant.
	2 nd	disadvantages of hydroelectric power plant.
	3 rd	Classify and explain the general arrangement of storage type hydroelectric project
	4 th	Explain its operation.
14 th	1 st	Selection of site of hydel power plant.
	2 nd	List of hydro power stations with their capacities and number of units in the state.
	3 rd	Types of turbines and generation used.
	4 th	Simple problems.
15 th	1 st	6.0 GAS TURBINE POWER STATIONS: Selection of site for gas turbine stations.
	2 nd	Fuels for gas turbine, Elements of simple gas turbine power plants
	3 rd	Merits, demerits and application of gas turbine power plants.
	4 th	Question Answer Discussion