UTKALMANI GOPABANDHU INSTITUTE OF ENGINEERING, ROURKELA

LESSON PLAN

SESSION-2022-23

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: 14.02.2023 to Date: 23.05.2023 No. Of Weeks: 15
Week	**Class/Day**	**Theory/Practical Topics**
1st	1st	**2.0 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.
	2nd	Explain the disposal of nuclear waste.
	3rd	Selection of site for nuclear power stations, List of nuclear power stations.
	4th	**4.0 DIESEL ELECTRIC POWER STATIONS:** State the advantages and disadvantages of diesel electric power stations.
12th	1st	Explain briefly different systems of diesel electric power stations: Fuel storage and fuel supply system, Fuel injection system.
	2nd	Air supply system, Exhaust system, cooling system, Lubrication system, starting system, governing system.
	3rd	Selection of site for diesel electric power stations.
	4th	Performance and thermal efficiency of diesel electric power stations.
13th	1st	**5.0 HYDEL POWER STATIONS:** State advantages of hydroelectric power plant.
	2nd	disadvantages of hydroelectric power plant.
	3rd	Classify and explain the general arrangement of storage type hydroelectric project
	4th	Explain its operation.
14th	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	Types of turbines and generation used.
	4th	Simple problems.
15th	1st	**6.0 GAS TURBINE POWER STATIONS:** Selection of site for gas turbine stations.
	2nd	Fuels for gas turbine, Elements of simple gas turbine power plants
	3rd	Merits, demerits and application of gas turbine power plants.
	4th	Question Answer Discussion

LEARNING RESOURCES:

Sl. No.	***Name of Authors***	***Title of the Book***	***Name of the Publisher***
1	R.K Rajput	Power Plant Engineering	Laxmi Publication
2	P.K.NAG	Power Plant Engineering	TMH
3	Nag pal G,R	Power plant Engineering	Khanna Publisher
4	P.C. SHARMA	Power Plant Engineering	S.K KATARIA &SONS