GOVERNMENT POLYTECHNIC, NABARANGPUR

DEPARTMENT OF MECHANICAL ENGINEERING

Discipline: **MECHANICAL ENGG**	Semester: **6TH**	Name of the Teaching Faculty: Lect. Laxman Golari
Subject: **POWER STATION ENGINEERING**	No. of days/per week class allotted: **4**	Semester From date :04.02.2025 To Date: 17.05.2025 No. of Weeks: 15
COURSE OUTCOMES	**CO1:** UNDERSTAND GENERATION OF POWER BY VARIOUS ENERGY SOURCES. **CO2:** UNDERSTAND USE OF STEAM, OPERATION IN THERMAL POWER STATION. **CO3:** UNDERSTAND NUCLEAR ENERGY SOURCES & POWER DEVELOPED. **CO4:** UNDERSTAND DIESEL ELECTRIC & HYDROELECTRIC POWER STATION. **CO5:** UNDERSTAND THE BASICS OF GAS TURBINE POWER SATION.	

Week	Class Day	Theory/Practical Topics
1st	1st	describe sources of energy.
	2nd	central & captive power station, classify power plants.
	3rd	importance of electricity in day-to-day life.
	4th	describe method of electrical power generation
2nd	1st	quiz & assignment - i
	2nd	layout of steam power station.
	3rd	steam power cycle: carnot vapour power cycle (cvpc)
	4th	cvpc with p-v & t-s diagram & thermal efficiency (con..)
3rd	1st	rankine cycle with p-v,t-s & h-s diagram, work done
	2nd	rankine cycle: work ratio, thermal efficiency, specific steam consumption (contd…)
	3rd	rankine cycle numericals (contd…)
	4th	list of thermal power stations in the state.
4th	1st	boiler: operation of air pre-heater, economiser
	2nd	boiler: electrostatic precipitator, super heater(contd..)
	3rd	need of boiler mountings & operation of boiler. (contd..)
	4th	draught systems: natural, forced, balanced
5th	1st	draught systems: advantages & disadvantages (contd..)
	2nd	steam turbine: elements, adv. & disadv, performance
	3rd	steam turbine: governing, thermal efficiency, stage efficiency, gross efficiency (contd..)
	4th	steam condenser: classification, function.
6th	1st	function of condenser auxillaries such as hot well
	2nd	extraction pump: condenser, circulating, airextraction
	3rd	cooling tower: function, types; spray ponds.
	4th	selection of site for thermal power stations.
7th	1st	quiz & assignment - ii
	2nd	classify nuclear fuel (fissile & fertile material)
	3rd	explain fusion & fission reaction
	4th	working of nuclear power plant with block diagram.
8th	1st	nuclear power plant block diagram (contd..)
	2nd	working & construction of nuclear reactor.
	3rd	compare nuclear & thermal power plants.

	4th	explain the disposal of nuclear waste.
9th	1st	selection of site for nuclear power station.
	2nd	lists of nuclear power station in the state.
	3rd	quiz & assignment - iii
	4th	diesel electric power station: advantages
10th	1st	diesel electric power station: disadvantages (contd..)
	2nd	different systems of diesel electric power stations
	3rd	fuel storage, fuel supply system, fuel injection system.
	4th	air supply, exhaust, cooling, lubrication, starting, governing system. (contd...)
11th	1st	selection of site for diesel electric power station.
	2nd	performance of diesel electric power station.
	3rd	efficiency of diesel electric power station.
	4th	revision
12th	1st	quiz & assignment - iv
	2nd	hydroelectric power plant: adv. & disadv.
	3rd	classify & explain the general arrangement of storage type hydroelectric power plant (sthpp)
	4th	operation of storage type hydroelectric plant (contd..)
13th	1st	selection of site for hydroelectric power plant.
	2nd	list of hydropower stations: capacities & no. in state.
	3rd	types of turbines & generations used
	4th	types of turbines & generations used (contd…)
14th	1st	simple numericals.
	2nd	simple numericals.
	3rd	quiz & assignment - v
	4th	selection of site for gas turbine stations.
15th	1st	fuels for gas turbine.
	2nd	elements of simple gas turbine power plants.
	3rd	merits, demerits & applications of gas turbine plants.
	4th	quiz & assignment - vi

learning resources:

power plant engineering, r.k rajput, laxmi publication.
power plant engineering, p.k nag, tmh publication.
power plant engineering, g.r nagpal, khanna publisher.
power plant engineering, p.c sharma, s.k kataria & sons publications.

Sign Of Faculty Concerned Laxman Gojari 24.02.2025

Sign. Of HOD 24/2/2025

Academic Coordinator 03/02/25

Principal 7.2.25