

**GOVT. POLYTECHNIC, NAYAGARH**  
**6TH SEMESTER, MECHANICAL ENGINEERING (2025-26)**

**SUBJECT:- TH.3 - POWER STATION ENGINEERING**

Semester from 22.12.25 to  
**18.04.26**

Total Periods -60, Theory- 4P/WEEK

**NAME OF FACULTY:- Sri Saurav Ranjan Pradhan**

<b>Sl. No.</b>	<b>Week</b>	<b>Day</b>	<b>Topics to be covered</b>
1	1ST	1st	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, Overview of method of electrical power generation
<b>Sl. No.</b>	<b>Week</b>	<b>Day</b>	<b>Topics to be covered</b>
2	2ND	1st	Revision of CH-1 & Assignment Questions
		2nd	<b>THERMAL POWER STATIONS:-</b> 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
<b>Sl. No.</b>	<b>Week</b>	<b>Day</b>	<b>Topics to be covered</b>
3	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
<b>Sl. No.</b>	<b>Week</b>	<b>Day</b>	<b>Topics to be covered</b>
4	4TH	1st	Boiler Accessories: Operation of Air pre heater, Operation of Economiser, Operation Electrostatic precipitator and Operation of super heater Need of boiler mountings and operation of boiler
		2nd	Draught systems (Natural draught, Forced draught & balanced draught) with their advantages & disadvantages
		3rd	Draught systems (Natural draught, Forced draught & balanced draught) with their advantages & disadvantages
		4th	Steam prime movers: Advantages & disadvantages of steam turbine
<b>Sl. No.</b>	<b>Week</b>	<b>Day</b>	<b>Topics to be covered</b>
5	5TH	1st	Elements of steam turbine, governing of steam turbine
		2nd	Performance of steam turbine
		3rd	Explain Thermal efficiency, Stage efficiency and Gross efficiency
		4th	Steam condenser, Function of condenser
6	6TH	1st	Classification of condenser, function of condenser auxiliaries such as hot well
		2nd	Condenser extraction pump, air extraction pump, and circulating pump
		3rd	Cooling Tower: Function and types of cooling tower, and spray ponds
		4th	Selection of site for thermal power stations
<b>Sl. No.</b>	<b>Week</b>	<b>Day</b>	<b>Topics to be covered</b>
7	7TH	1st	Revision of CH-2 & Assignment Questions
		2nd	<b>NUCLEAR POWER STATIONS:-</b> Classify nuclear fuel (Fissile & fertile material)
		3rd	Explain fusion and fission reaction
		4th	Explain working of nuclear power plants with block diagram
<b>Sl. No.</b>	<b>Week</b>	<b>Day</b>	<b>Topics to be covered</b>
8	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
Sl. No.	Week	Day	<b>Topics to be covered</b>
		1st	Selection of site for nuclear power stations
		2nd	List of nuclear power stations
		3rd	Revision of CH-3 & Assignment Questions
		4th	<b>DIESEL ELECTRIC POWER STATIONS:-</b> State the advantages and disadvantages of diesel electric power stations
Sl. No.	Week	Day	<b>Topics to be covered</b>
		1st	Explain briefly different systems of diesel electric power stations: Fuel storage and fuel supply system
		2nd	Fuel injection system
		3rd	Air supply system
		4th	Exhaust system
Sl. No.	Week	Day	<b>Topics to be covered</b>
		1st	Cooling system, Lubrication system
		2nd	Starting system, governing system
		3rd	Selection of site for diesel electric power stations.
		4th	Performance and thermal efficiency of diesel electric power stations
Sl. No.	Week	Day	<b>Topics to be covered</b>
		1st	Revision of CH-4 & Assignment Questions
		2nd	<b>HYDEL POWER STATIONS:-</b> 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
Sl. No.	Week	Day	<b>Topics to be covered</b>
		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	Types of turbines and generation used
Sl. No.	Week	Day	<b>Topics to be covered</b>
		1st	Simple problems
		2nd	Simple problems
		3rd	Revision of CH-5 & Assignment Questions
		4th	<b>GAS TURBINE POWER STATIONS:-</b> Selection of site for gas turbine stations
Sl. No.	Week	Day	<b>Topics to be covered</b>
		1st	Fuels for gas turbine
		2nd	Elements of simple gas turbine power plants
		3rd	Merits, demerits and application of gas turbine power plants
		4th	Revision of CH-6 & Assignment Questions

### LEARNING RESOURCES-

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


  
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