

# GOVERNMENT CO-ED POLYTECHNIC RAIPUR (C.G)

## DEPARTMENT OF MECHANICAL ENGINEERING

### LESSON PLAN

Session: JAA-JUNE 2025

Session start as per university calendar:

Course Name: Power Plant Engineering

Course code : 2037672(037)

Name of Subject Teacher: MR. HEMSAGAR GUPTA

Lecturer plan Theory = 51

Discipline: Mechanical	Semester: 6th					
Lecture No.	Unit No.	Topic to be covered under this unit	Total hours	Planned Date	Execution Date	Remarks if any
1	Steam Power Plant	1.1 General layout of modern thermal power plant, Site selection, Presents status of power generation in India, Elements of power plant, function of each element, steam condition and dryness fraction.	8	06/01/25	06/01/25	
2		1.2 Rankine cycle: Representation on PV, TS, HS plane, efficiency of Rankine cycle, Revision & improvement of thermal efficiency of Rankine cycle by lowering exhaust pressure, increasing boiler pressure and superheating of steam.		08/01/25	08/01/25	
3		Numerical problems.		09/01/25	09/01/25	
4		Numerical problems.		27/01/25	27/01/25	
5		1.3 Reheat cycle- representation on T-S and H-S Planes, flow diagram and advantages.		29/01/25	29/01/25	
6		1.4 Simple regenerating cycle		30/01/25	30/01/25	

7		1.5 Flow diagram, representation on T-S and H-S plants, bleeding and feed power heating and pumping, advantages of regenerative cycle.	03/02/25	03/02/25		
8		1.6 Power station- Types of power station such as central power station, industrial power station, captive power station, advantages, and classification of power plants.	05/02/25	05/02/25		
9	Elements of power plant	2.1 Steam Generators: Classification according to working pressure. (a)Low pressure boilers- Cochran, Lancashire and locomotive boilers	06/02/25	06/02/25		
10		(b)High pressure boilers in modern steam power plants such as Velox, Benson, La-mont, Leoffler, supercritical boilers.	10/02/25	10/02/25		
11		2.2 (a)Boiler mountings- Safety valves, water level indicator, pressure gauge, blow off cock etc.	12/02/25	12/02/25		
12		(b) Accessories – super heater, economizer, pre heater and draft equipment.	13/02/25	13/02/25		
13		Superheat control methods, Pulverized fuel and necessity, storing systems etc.	13/02/25	13/02/25		
14		2.3 Steam Prime mover- Steam nozzle-types	17/02/25	17/02/25		
15		Velocity of steam at outlet, Weight of discharge,	18/02/25	18/02/25		
16		Area of cross section at throat and outlet, Critical pressure	19/02/25	19/02/25		
17			3.1 Gas Turbine Power Plants- Brayton cycle, classification of Brayton or Joule Cycle,	20/02/25	20/02/25	
18			Open and Close cycle, representation of cycle on P.V. and T.S. diagram.	20/02/25	20/02/25	

19	Gas & Diesel Power Plants	3.2 Thermal efficiency in terms of terminal temperature and pressure, effect of pressure ratio on thermal efficiency,
20		Advantages and disadvantages of open and close cycle gas turbines, Important components of gas turbine power plant,
21		3.3 Methods of improving thermal efficiency, Essential auxiliaries and controls of a gas turbine power plants
22		Fuels for gas turbines.
23		3.4 Diesel power plant layout, Functions & components of diesel power plant
24		Diesel power plant systems such as -Cooling and lubrication system,
25		fuel injection system, solid injection system – common rail system, individual pump system, distribution system, data
26		Numerical problems.
27		4.1 Evolution of nuclear energy from atoms by fission and fusion. Chain reactions, fission materials,
28		
29	metal cooled and fast reactor	
30	4.2 Probable crack location: junction of main and cross wall, junction of slab and wall	
31	4.3 Arrangements of various elements in a nuclear power station,	
32	steam cycles and boilers coolant heat exchangers, Reactor control, Reactor shielding and safety methods.	

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24/02/25	24/02/25	
25/02/25	25/02/25	
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11/03/25	11/3/25	
11/03/25	11/3/25	
13/03/25	13/03/25	
13/03/25	13/3/25	

33	Nuclear Power Station	4.4 Setting of Nuclear plants: Site evaluation Stages, Site Rejection Criteria,	10	17/03/25	17/03/25	
34		Earthquake, Geological criteria, Meteorological considerations, Flooding, Tsunami, Shoreline erosion, chemical explosion,		18/03/25	20/3/25	
35		Radiological impact study, Radioactivity pathways to humans, environmental Impact study.		19/03/25	20/3/25	
36		4.4 Hazards in nuclear power station – units of radiations, safe and dangerous dozes of radiations		20/03/25	24/3/25	
37		safety precautions in nuclear power station, Nuclear power plants in India.		20/03/25	24/3/25	
38		Hydro Electric Power Plants		5.1 Potential power with reference to rainfall and catchments area, Water storage	6	24/03/25
39	Element of hydro electric power stations.		26/03/25	24/3/25		
40	5.2 Characteristics of hydraulic turbine		27/03/25	26/03/25		
41	Comparison of the factors governing the cost of hydro, steam and diesel power stations.		27/03/25	26/03/25		
42	5.3 Building cracks and its prevention, common methods for dormant crack repairs such as Epoxy injection		02/03/25	27/03/25		
43	5.4 Strengthening methods for live cracks such as addition of reinforcements, Jacketing, brackets		07/03/25	27/03/25		
44			6.1 Effect of load variation on shaft speed, steam admission, valve opening, steam flow rate			08/03/25
45		Effect of load variation on steam pressure and combustion control system.	09/04/25		04/04/25	

46	Steam Power station Control and Economics	6.2 Necessity of controlling factors in load variation, Control system (area system, centralized control system)	15/04/25	07/04/25	
47		Basic elements of control system, controls and instruments located in modern control station.	16/04/25	08/04/25	
48			17/04/25	09/04/25	
49		6.3 Concept of occurrence of fluctuating loads,	17/04/25	15/04/25	
50		Load curve and its significance, Definition and terminology of connected load, maximum demand, demand factor, average load, load factor, diversity factor	21/04/25	21/04/25	
51		Definition and terminology of plant capacity factor, plant use factor, effect of variable load and remedies.	23/04/25	22/04/25	

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*Jhu*

  
Subject Teacher

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