

Academic Lesson Plan for Thermal -II(Summer-2024)		
Discipline: Mechanical Engineering	Semester: 4th	Name of Faculty: Dharma prakash Samal
Subject:Thermal -II	No. of days/per week Class Allotted: 4	Semester from: 16/01/2024
		No. of weeks:15
Week	Class Day	Theory Topics
1st	1st	Define Mechanical Efficiency, Indicated Thermal Efficiency
	2nd	Relative Efficiency, Brake Thermal Efficiency,Overall Efficiency
	3rd	Mean Effective Pressure & Specific Fuel Consumption
	4th	Define air-fuel ratio& calorific value of fuel
2nd	1st	Workout problems to determine efficiencies & specific fuel consumption.
	2nd	Doubt clearing class on 1 st chapter.
	3rd	Explain functions of air-compressor & it's industrial use.
	4th	Classify air-compressor & principle of operation.
3rd	1st	Describe parts & working principle of a reciprocating air- compressor
	2nd	Explain various terminology for reciprocating compressor.
	3rd	Derive workdone of single stage air-compr. with & without clearance
	4th	Derive workdone of double stage air-compr. with & without clearance
	1st	Workout simple problems.

4th	2nd	Doubt clearing class on air- compressor
	3rd	Difference between gas & vapour.
	4th	Formation of steam & its type.
5th	1st	Representing steam on P-V, T-S,H-S & T-H diagram
	2nd	Definition & properties of steam.
	3rd	Use of steam table & Mollier chart
	4th	Non-flow & flow processes of vapour.
6th	1st	Determine the changes in properties & solve simple numerals.
	2nd	Determine the changes in properties & solve simple numerals.
	3rd	Determine the changes in properties & solve simple numerals.
	4th	Revision of internal exam. Questions.
7th	1st	Classification of boiler
	2nd	Types of boiler
	3rd	Important terms connected with boiler
	4th	Comparision between firetube & watertube boiler.
8th	1st	Description & working of Cochran Boiler
	2nd	Description & working of Babcock & Wilcox Boiler
	3rd	Description & working of Lancashire Boiler
	4th	Boiler Draught
9th	1st	Boiler Mountings
	2nd	Boiler Accssessories
	3rd	Doubt Clearing class.
	4th	Carnot cycle with vapour.

10th	1st	Derive work & efficiency
	2nd	Rankine cycle in P-V, T-S & H-S diagram
	3rd	Derive work & efficiency of Rankine cycle
	4th	Effect of various end condition in Rankine cycle
11th	1st	Reheat cycle & Regenerative cycle
	2nd	Simple problems on Carnot vapour cycle & Rankine cycle.
	3rd	Doubt clearing class on steam power cycle.
	4th	Modes of heat transfer & Fourier's law of heat conduction & thermal conductivity.
12th	1st	Newton's law of cooling & Radiation heat transfer (Stefan-Boltzmann law)
	2nd	Black body radiation, emissivity
	3rd	absorptivity & transmissivity.
	4th	Doubt clearing class on heat transfer.
13th	1st	Important terms connected with boiler
	2nd	Important terms connected with boiler
	3rd	Rankine cycle in P-V, T-S & H-S diagram
	4th	Derive work & efficiency of Rankine cycle
14th	1st	Effect of various end condition in Rankine cycle
	2nd	Description & working of Babcock & Wilcox Boiler
	3rd	Description & working of Lancashire Boiler
	4th	Boiler Draught
15th	1st	Boiler Mountings
	2nd	Boiler Accessories
	3rd	Description & working of Babcock & Wilcox Boiler
	4th	Doubt clearing class on steam power cycle.

Dharmaprasad Samal

Academic Lesson Plan for POWER STATION ENGINEERING (Summer-2024)		
Discipline: Mechanical Engineering	Semester: 6th	Name of Faculty: Dharma Prakash Samal
Subject: POWER STATION ENGINEERING	No. of days/per week Class Allotted: 4	Semester from: 16/01/2024
		No. of weeks:15
Week	Class Day	Theory Topics
1st	1st	1.1 INTRODUCTION
	2nd	1.1 Describe source of energy
	3rd	1.2 Explain the concept of central & captive power station
	4th	1.3 Classify power plants
2nd	1st	1.4 Importance of electric power in day today life
	2nd	1.5 Overview of method of electrical power generation
	3rd	2.0 Thermal Power Station
	4th	2.1 Layout of steam power stations
3rd	1st	2.2 Steam Power Cycle
	2nd	2.3 Explain Rankine cycle with P-V, T-S diagram and determine thermal efficiency
	3rd	2.4 Explain Rankine cycle with P-V, T-S diagram and determine thermal efficiency, workdone work ratio
	4th	
4th	1st	2.6 Solve simple problems on above
	2nd	2.7 List of thermal power stations in the state with capacities
	3rd	2.8 Explain the operation of air pre-heater, operation of economiser, ESP & superheater
	4th	2.9 Need of boiler mounting and operation of boiler
5th	1st	2.10 Draught system, natural draught, forced draught &
	2nd	2.11 Advantages and disadvantages of draught
	3rd	2.12 Steam prime mover: Advantages & Disadvantages

	4th	2.13 Elements of steam turbine, governing of steam turbine & their performance
6th	1st	2.14 Explain thermal efficiency, reheat and cross efficiency
	2nd	2.15 Steam Condenser: Function and classification of Condenser
	3rd	2.16 Cooling Tower: Function & its types, spray ponds
	4th	2.17 Selection of site for thermal power station
7th	1st	3.0 Nuclear Power Station
	2nd	3.1 Classify Nuclear Fuel & explain fusion fission reaction
	3rd	3.2 Explain working of Nuclear Power Plant with block diagram
	4th	3.3 Construction of Nuclear reactor
8th	1st	3.4 Compare the nuclear & power plants
	2nd	3.5 Selections of site for nuclear power stations
	3rd	3.6 List of Nuclear Power Stations
	4th	4.0 Diesel Electric Power Stations
9th	1st	4.1 State the advantages and disadvantages of Diesel Electric Power Stations
	2nd	4.2 Explain briefly different systems of diesel electric power stations: Fuel storage, supply & injection system
	3rd	4.3 Air supply system, Exhaust system, Cooling, Lubrication, Starting, Governing System
	4th	4.4 Selection of site for diesel electric power stations
10th	1st	4.5 Performance & thermal efficiency of diesel electric
	2nd	5.0 Hydel Power Stations
	3rd	5.1 State advantages & disadvantages of hydro electric power
	4th	5.2 Classify & explain the general arrangement of storage type hydroelectric project
11th	1st	5.3 Explain the operation of hydroelectric project
	2nd	5.4 Selection site of hydel power plant
	3rd	5.5 List of hydro power stations
	4th	5.6 List the capacities & number of units in the state
12th	1st	5.7 Types of turbines & generators used
	2nd	5.8 Simple problems

	3rd	6.0 Gas Turbine Power Stations
	4th	6.1 Selection of site for gas turbine stations
13th	1st	6.2 Fuels for gas turbine
	2nd	6.3 Elements for simple gas turbine power plants
	3rd	6.4 Merits, demerits & application of gas turbine power stations
	4th	6.0 Gas Turbine Power Stations
14th	1st	6.1 Selection of site for gas turbine stations
	2nd	6.2 Fuels for gas turbine
	3rd	6.3 Elements for simple gas turbine power plants
	4th	6.4 Merits, demerits & application of gas turbine power stations
15th	1st	6.0 Gas Turbine Power Stations
	2nd	6.1 Selection of site for gas turbine stations
	3rd	6.2 Fuels for gas turbine
	4th	6.3 Elements for simple gas turbine power plants

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