GOVERNMENT POLYTECHNIC,NUAPADA

Academic Lesson Plan for Summer semester- 2023-24

Name of the teaching faculty: Er. Siddhant Singh Babu
Department: Mechanical Engineering
Semester: 6th
Subject: Power Station Engineering
No. of periods per week: 4
Total Periods: 60
End semester exam: 80
Class test: 20
Total Marks : 100

Sl. No.	Week	Period	Topic to be covered
1.	1st	1st	About Power Station Engineering
2.		2nd	Describe sources of energy.
3.		3rd	Do
4.		4th	Explain concept of Central and Captive power station.
5.	2nd	1st	Classify power plants.
6.		2nd	Layout of steam power stations.
7.		3rd	Explain about carnotvapour power cycle
8.		4th	Do
9.	3rd	1st	Explain about Rankine vapour power cycle
10.		2nd	Do
11.		3rd	Do
12.		4th	Solved Simple Problems.
13.	4th	1st	Do
14.		2nd	Do
15.		3rd	List of thermal power stations in the state with their capacities.
16.		4th	About Boiler Accessories
17.	5th	1st	Do
18.		2nd	Do
19.		3rd	Do
20.		4th	Explain Boiler Draught System
21.	6th	1st	About Steam Prime Mover
22.		2nd	Do
23.		3rd	About Condenser
24.		4th	Do
25.	7th	1st	Selection of site for thermal power stations.
26.		2nd	About Nuclear Power Station
27.		3rd	Classify nuclear fuel
28.		4th	Explain fusion and fission reaction.
29.	8th	1st	Explain working of nuclear power plants with block diagram
30.		2nd	Explain the working and construction of nuclear reactor
31.		3rd	Do
32.		4th	Do
33.	9th	1st	Compare the nuclear and thermal plants.
34.		2nd	Explain the disposal of nuclear waste
35.		3rd	Selection of site for nuclear power stations & It list of Presnt
36.		4th	About Diesel Electric Power Station
37.	10th	1st	State the advantages and disadvantages of diesel electric power stations.
38.		2nd	Explain briefly different systems of diesel electric power stations
39.		3rd	Do
40.		4th	Do
41.	11th	1st	Do

42.		2nd	Do
43.		3rd	Selection of site for diesel electric power stations.
44.		4th	Performance and thermal efficiency of diesel electric power stations
45.	12th	1st	Do
46.		2nd	About Gas Turbine Power Station
47.		3rd	Selection of site & Fuels for gas turbine stations.
48.		4th	Elements of simple gas turbine power plants
49.	13th	1st	Do
50.		2nd	Merits, demerits and application of gas turbine power plants.
51.		3rd	About Hydel Power Station
52.		4th	State advantages and disadvantages of hydroelectric power plant.
53.	14th	1st	Classification of hydroelectric Power Station
54.		2nd	explain the general arrangement of storage type hydroelectric project.
55.		3rd	explain its operation.
56.		4th	Do
57.	15th	1st	List of hydro power stations with their capacities and number of units in the state.
58.		2nd	Selection of site of hydel power plant.
59.		3rd	Types of turbines and generation used.
60.		4th	Solve simple problems

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Name of the teaching faculty: Er. Siddhant Singh Babu
Department: Mechanical Engineering
Semester: 4th
Subject: Fluid Mechanics
No. of periods per week: 4
Total Periods: 60
End semester exam: 80
Class test: 20
Total Marks: 100

Sl. No.	Week	Period	Topic to be covered
1.	1st	1st	Define fluid
2.		2nd	Description of fluid properties
3.		3rd	Density, Specific weight, specific gravity,
4.		4th	specific volume and solve simple problems.
5.	2nd	1st	solve simple problems.
6.		2nd	Definitions and Units of Dynamic viscosity
7.		3rd	kinematic viscosity, surface tension
8.		4th	Capillary phenomenon
9.	3rd	1st	Definitions and units of fluid pressure
10.		2nd	pressure intensity and pressure head
11.		3rd	Statement of Pascal's Law.
12.		4th	Concept of atmospheric pressure, gauge pressure
13.	4th	1st	vacuum pressure and absolute pressure
14.		2nd	Pressure measuring instruments Manometers
15.		3rd	Bourdon tube pressure gauge
16.		4th	Solve simple problems on Manometer
17.	5th	1st	Definition of hydrostatic pressure
18.		2nd	Total pressure and centre of pressure on immersed bodies
19.		3rd	Horizontal and Vertical Bodie
20.		4th	Archimedes 'principle, concept of buoyancy
21.	6th	1st	meta center and meta centric height
22.		2nd	Do
23.		3rd	Concept of floatation
24.		4th	Types of fluid flow
25.	7th	1st	Continuity equation
26.		2nd	Statement and proof for one dimensional flow
27.		3rd	DO
28.		4th	Bernoulli's theorem(Statement and proof)
29.	8th	1st	Applications and limitations of Bernoulli's theorem
30.		2nd	Venturimeter, pitot tube
31.		3rd	Solve simple problems
32.		4th	Solve simple problems, Define orifice
33.	9th	1st	Flow through orifice
34.		2nd	Orifices coefficient & the relation between the orifice coefficients
35.		3rd	Do
36.		4th	Classifications of notches & weirs
37.	10th	1st	Discharge over a rectangular notch or weir
38.		2nd	Do
39.		3rd	Discharge over a triangular notch or weir
40.		4th	Do
41.	11th	1st	Simple problems on above
42.		2nd	Flow through pipe,Definition of pipe

43.		3rd	Loss of energy in pipes.
44.		4th	Do
45.	12th	1st	Head loss due to friction
46.		2nd	Darcy's and Chezy's formula (Expression only)
47.		3rd	Solve Problems using Darcy's and Chezy's formula.
48.		4th	Hydraulic gradient and total gradient line
49.	13th	1st	Impact of jet on fixed and moving vertical flat plates
50.		2nd	Derivation of work done on series of vanes.
51.		3rd	Do
52.		4th	Derivation of work done on series of vanes
53.	14th	1st	Do
54.		2nd	Condition for maximum efficiency.
55.		3rd	Impact of jet on moving curved vanes
56.		4th	illustration using velocity triangles
57.	15th	1st	Do
58.		2nd	derivation of work done,
59.		3rd	Do
60.		4th	Explain efficiency.

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Academic Lesson Plan for Summer semester- 2023-24

Name of the teaching faculty: Er. Siddhant Singh Babu
Department: Mechanical Engineering
Semester: 4th
Subject: Thermal Engineering II
No. of periods per week: 4
Total Periods: 60
End semester exam: 80
Class test: 20
Total Marks: 100

Sl. No.	Week	Period	Topic to be covered
1.	1st	1st	About IC Engine performance
2.		2nd	Explain types of efficiency
3.		3rd	Do
4.		4th	Do
5.	2nd	1st	Define Air & Fuel ratio, CV
6.		2nd	Some Problem solved
7.		3rd	Do
8.		4th	Do
9.	3rd	1st	About Air compressor
10.		2nd	Explain functions of compressor & industrial use.
11.		3rd	Classification of air compressor & operation.
12.		4th	Do
13.	4th	1st	Explain the parts and working principle of reciprocating Air compressor.
14.		2nd	Do
15.		3rd	Explain the terminology of reciprocating compressor.
16.		4th	Explain working Principal of single stage Reciprocating Compressor .
17.	5th	1st	Do
18.		2nd	Explain working Principal of Multistage stage Reciprocating Compressor .
19.		3rd	Solve simple problems
20.		4th	Do
21.	6th	1st	About Steam & Difference between gas &vapours.
22.		2nd	Formation of steam
23.		3rd	Representation on P-V, T-S, H-S, & T-H diagram.
24.		4th	Do
25.	7th	1st	Properties of Steam & Terms
26.		2nd	Do
27.		3rd	Use of steam table &mollier chart for finding unknown properties.
28.		4th	Do
29.	8th	1st	Non flow & flow process of vapour.
30.		2nd	P-V, T-S & H-S, diagram.
31.		3rd	Solve simple problems
32.		4th	Do
33.	9th	1st	About Boiler & Classification
34.		2nd	Do
35.		3rd	Important terms for Boiler.
36.		4th	Comparison between fire tube & Water tube Boiler
37.	10th	1st	Description & working of common boilers.
38.		2nd	Do
39.		3rd	Do
40.		4th	About Boiler Draught system

41.	11th	1st	Description of Boiler mountings & accessories.
42.		2nd	Do
43.		3rd	Do
44.		4th	Do
45.	12th	1st	About Vapour Power Cycle/ Steam Power Cycle
46.		2nd	Explain Carnot cycle with vapour.
47.		3rd	Do
48.		4th	Explain Rankine Cycle.
49.	13th	1st	Do
50.		2nd	Do
51.		3rd	Slove Some Problem
52.		4th	Do
53.	14th	1st	Modes of Heat Transfer.
54.		2nd	Fourier law of heat conduction and thermal conductivity.
55.		3rd	Newton's laws of cooling.
56.		4th	Explain Radiation heat transfer.
57.	15th	1st	Do
58.		2nd	Black body Radiation, Definition of Emissivity, absorptivity, & transmissibility
59.		3rd	Do
60.		4th	Do

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Academic Lesson Plan for Summer semester- 2023-24

Name of the teaching faculty: Er. Siddhant Singh Babu

Department: Mechanical Engineering

Semester: 4th

Subject: : WORKSHOP PRACTICE-III

No. of periods per week: 6

Total Periods: 90

End Semester exam: 50 Sessional: 50 Total Marks: 100

Sl. No	Week	Period	Topic to be covered
1	1st	1st	Job in evolving drilling, boring
2		2nd	Do
3		3rd	Do
4		4th	Do
5		5th	Do
6		6th	Do
7	2nd	1st	Do
8		2nd	Do
9		3rd	Do
10		4th	Do
11		5th	Do
12		6th	Do
13	3rd	1st	Do
14		2nd	Do
15		3rd	Do
16		4th	Internal/External threading on Turning jobs
17		5th	Do
18		6th	Do
19	4th	1st	Do
20		2nd	Do
21		3rd	Do
22		4th	Do
23		5th	Do
24		6th	Do
25	5th	1st	Do
26		2nd	Do
27		3rd	Do
28		4th	Do
29		5th	Do
30		6th	Do
31	6th	1st	Job in evolving use of Capstan and turret lathe (Taper Turning & Chamfering)
32		2nd	Do
33		3rd	Do
34		4th	Do
35		5th	Do
36		6th	Do
37	7th	1st	Do
38		2nd	Do
39		3rd	Do
40		4th	Do
41		5th	Do
42		6th	Do
43	8th	1st	Do
44		2nd	Do

45		3rd	Do
46		4th	All gear lathe, CNC Lathe Trainer Practice
47		5th	Do
48		6th	Do
49	9th	1st	Do
50		2nd	Do
51		3rd	Do
52		4th	Job involving all turning process on MS Rod &aluminum rod for jobs using CNC Lathe trainer.
53		5th	Do
54		6th	Do
55	10th	1st	Do
56		2nd	Do
57		3rd	Do
58		4th	Do
59		5th	Do
60		6th	Do
61	11th	1st	Shaper Preparation of V Block on CI or MS Blocks
62		2nd	Do
63		3rd	Do
64		4th	Do
65		5th	Do
66		6th	Do
67	12th	1st	Do
68		2nd	Do
69		3rd	Do
70		4th	Do
71		5th	Do
72		6th	Do
73	13th	1st	Do
74		2nd	Do
75		3rd	Do
76		4th	Milling Machine Preparation of Spur gear on CI or MS round
77		5th	Do
78		6th	Do
79	14th	1st	Do
80		2nd	Do
81		3rd	Do
82		4th	Do
83		5th	Do
84		6th	Do
85	15th	1st	Do
86		2nd	Do
87		3rd	Do
88		4th	Do
89		5th	Do
90		6th	Do

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Name of the teaching faculty: Er. Siddhant Singh Babu

Department: Mechanical Engineering

Semester: 6th

Subject: Power Station Engineering Lab

No. of periods per week: 4

Total Periods: 60

End semester exam: 50

Sessional: 25

Total Marks: 75

Sl. No.	Week	Period	Topic to be covered
1.	1st	1st	To study the modern steam power plant with model.
2.		2nd	Do
3.		3rd	Do
4.		4th	Do
5.	2nd	1st	Do
6.		2nd	Do
7.		3rd	To determine the various efficiencies of steam turbine.
8.		4th	Do
9.	3rd	1st	Do
10.		2nd	Do
11.		3rd	Do
12.		4th	Do
13.	4th	1st	Do
14.		2nd	Do
15.		3rd	To study the cooling tower.
16.		4th	Do
17.	5th	1st	Do
18.		2nd	Do
19.		3rd	Do
20.		4th	Do
21.	6th	1st	Do
22.		2nd	Do
23.		3rd	Study of jet condenser
24.		4th	Do
25.	7th	1st	Do
26.		2nd	Do
27.		3rd	Do
28.		4th	Do
29.	8th	1st	Do
30.		2nd	Do
31.		3rd	Study of De-lavel turbine
32.		4th	Do
33.	9th	1st	Do
34.		2nd	Do
35.		3rd	Do
36.		4th	Do
37.	10th	1st	To study the spring loaded safety valve.
38.		2nd	Do
39.		3rd	Do

40.		4th	Do
41.	11th	1st	Do
42.		2nd	Do
43.		3rd	To study the steam generators (boilers)models.
44.		4th	Lancashire boiler
45.	12th	1st	Do
46.		2nd	Do
47.		3rd	Do
48.		4th	Do
49.	13th	1st	Cornish boiler
50.		2nd	Do
51.		3rd	Do
52.		4th	Do
53.	14th	1st	Babcock & Wilcox Boiler
54.		2nd	Do
55.		3rd	Do
56.		4th	Do
57.	15th	1st	Vertical water tube boiler.
58.		2nd	Do
59.		3rd	Do
60.		4th	Do

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