

**GOVERNMENT POLYTECHNIC JAIPUR**

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**DEPARTMENT OF MECHANICAL ENGINEERING  
LESSON PLAN (2023-2024)**

Discipline: Mechanical	Semester: 5TH	Name of the Teaching faculty: KEDARNATH JENA
Subject: HMIFP (Th-3)	No of Days/ Week class alloted: 4	Semester from Date: 01.08.2023 To Date: 31.11.2023 No of weeks: 15
Week	Class Day	Topics
1st	2nd	Introduction to HMIFP, Discuss total syllabus, with lesson plan, internal assessment and class tests etc.
	3rd	1.0 HYDRAULIC TURBINES.
		Definition of hydraulic machines and classification of hydraulic turbines
4th	Classification of left outs turbines according to different criteria.	
2nd	1st	Construction and working principle of impulse turbine.
	2nd	Velocity diagram of moving blades, work done and derivation of various efficiencies of impulse turbine.
	3rd	Velocity diagram of moving blades, work done and derivation of various efficiencies of impulse turbine.
	4th	Velocity diagram of moving blades, work done and derivation of various efficiencies of Francis turbine.
3rd	1st	Velocity diagram of moving blades, work done and derivation of various efficiencies of Francis turbine.
	2nd	Velocity diagram of moving blades, work done and derivation of various efficiencies of Kaplan turbine
	3rd	Velocity diagram of moving blades, work done and derivation of various efficiencies of Kaplan turbine
	4th	Numerical on above
4th	1st	Numerical on above
	2nd	Numerical on above
	3rd	Distinguish between impulse turbine and reaction turbine.
	4th	Previous year question discussion. Note and Assignment check.
5th	1st	2.0 CENTRIFUGAL PUMPS
		Construction and working principle of centrifugal pumps
	2nd	work done and derivation of various efficiencies of centrifugal pumps.
	3rd	work done and derivation of various efficiencies of centrifugal pumps.
4th	Numerical on above.	
6th	1st	Previous year question discussion. Note and Assignment check.
	2nd	<b>CLASS TEST 1</b>
	3rd	3.0 RECIPROCATING PUMPS
		Describe construction & working of single acting reciprocating pump.
	4th	Describe construction & working of double acting reciprocating pump.
1st	Derive the formula for power required to drive the pump (Single acting )	

7th	2nd	Derive the formula for power required to drive the pump ( double acting)
	3rd	Define slip, State positive & negative slip.
	4th	Establish relation between slip & coefficient of discharge.
8th	1st	Solve numerical on above
	2nd	Solve numerical on above
	3rd	Previous year question discussion. Note and Assignment check.
	4th	4.0 PNEUMATIC CONTROL SYSTEM Elements –filter-regulator-lubrication unit
9th	1st	Pressure control valves. 1. Pressure relief valves 2. Pressure regulation valves
	2nd	Direction control valves i) 3/2DCV,5/2 DCV,5/3DCV
	3rd	i) Flow control valves ii) Throttle valves
	4th	ISO Symbols of pneumatic components
10th	1st	ISO Symbols of pneumatic components
	2nd	Pneumatic circuits i) Direct control of single acting cylinder ii) Operation of double acting cylinder
	3rd	Operation of double acting cylinder with metering in control.
	4th	Operation of double acting cylinder with metering out control.
11th	1st	Previous year question discussion. Note and Assignment check.
	2nd	<b>CLASS TEST 2</b>
	3rd	5.0 HYDRAULIC CONTROL SYSTEM Hydraulic system, its merit and demerits
	4th	Hydraulic accumulators i) Pressure control valves
12th	1st	Hydraulic accumulators i) Pressure relief valves
	2nd	Hydraulic accumulators i) Pressure regulation valves
	3rd	Direction control valves i) 3/2DCV,5/2 DCV,5/3DCV
	4th	Direction control valves i) Flow control valves ii) Throttle valves
13th	1st	Fluid power pumps i) External and internal gear pumps
	2nd	Fluid power pumps i) Vane pump
	3rd	Fluid power pumps i) Radial piston pumps
	4th	ISO Symbols for hydraulic components.
14th	1st	Actuators
	2nd	Hydraulic circuits Direct control of single acting cylinder
	3rd	Hydraulic circuits Operation of double acting cylinder
	4th	Hydraulic circuits Operation of double acting cylinder with metering in control.

15th	1st	Hydraulic circuits Operation of double acting cylinder with metering in control.
	2nd	Comparison of hydraulic and pneumatic system
	3rd	Previous year question discussion. Note and Assignment check.
	4th	Previous year question discussion.
16th	1st	VST

SL.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHER
01	DR.JAGDISH LAL	HYDRAULIC MACHINES	METROPOLITAN BOOK CO
02	ANDREW	HYDRAULICS	
03	K SHANMUGA, SUNDARAM	HYDRAULIC &PNEUMATIC CONTROL	S.CHAND
04	MAJUMDAR	HYDRAULIC &PNEUMATIC CONTROL	TMH
05	J.F. BLACKBURN, G.REETHOF &J.L SHEARER	FLUID POWER CONTROL	

Signature of Faculty

*WAL*  
3/10/23