GOVERNMENT POLYTECHNIC JAJPUR
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LESSON PLAN
(2021-22)

Discipline : **Mechanical**	**Semester:** **5th**	**Name of the Teaching Faculty:** **Mahesh Kumar Patra**
Subject: **Hydraulic Machines & Industrial Fluid Power**	No. Of Days/Week Class Allotted	Semester From Date: 01/10/2021 To Date:31/01/2022 No. Of Weeks: 15
Week	**Class Day**	**Theory/Practical Topics**
1st	1st	Introduction to hydraulic machine. What is hydraulic turbine? How hydraulic turbine works?
	2nd	Classification of hydraulic turbine.
	3rd	Construction and working principle of impulse turbine (Pelton wheel)
	4th	Velocity diagram of moving blades, work done and efficiencies of Pelton turbine
2nd	1st	Numerical for Pelton turbine
	2nd	Construction and working principle of Francis turbine
	3rd	Velocity diagram of moving blades, work done and efficiencies of Francis turbine
	4th	Numerical for Francis turbine
3rd	1st	Construction and working principle of Kaplan turbine
	2nd	Velocity diagram of moving blades, work done and efficiencies of Kaplan turbine
	3rd	Numerical for Kaplan turbine
	4th	Difference between Impulse and Reaction turbine
4th	1st	Draft tube: Function & types, Governing of turbine
	2nd	Review class
	3rd	*Assignment Evaluation & Class Test*
	4th	What is Centrifugal pump? Construction and working principle of centrifugal pump.
5th	1st	Velocity diagram of moving blades, work done and efficiencies of Centrifugal pump
	2nd	Numerical for Centrifugal pump
	3rd	Review class
	4th	*Assignment Evaluation & Class Test*
6th	1st	What is reciprocating pump? Classification. Application. Working Principle

	2nd	Construction and working principle of single acting reciprocating pump.
	3rd	Construction and working principle of double acting reciprocating pump.
	4th	Determination of discharge and Power required for the pump (single & double acting).
7th	1st	Define Slip, positive and negative slip, Relation between slip and coefficient of discharge
	2nd	Numerical on above
	3rd	Review class
	4th	*Assignment Evaluation & Class Test*
8th	1st	What are Pneumatic systems? Application.
	2nd	Elements of Pneumatic system: Air Filter, Air regulator and Air lubricator
	3rd	Pressure control valves
	4th	Direction control valves
9th	1st	Flow control valves, Throttle valves
	2nd	ISO symbols for pneumatic circuits
	3rd	What is Pneumatic circuit? Components and Uses
	4th	Pneumatic circuit – Control of single acting cylinder
10th	1st	Pneumatic circuit – Operation of double acting cylinder
	2nd	Operation of double acting cylinder with Metering in and Metering out control
	3rd	Review class
	4th	*Assignment Evaluation & Class Test*
11th	1st	Hydraulic system, its merit and demerit
	2nd	Hydraulic Accumulators,
	3rd	Pressure control valve
	4th	Pressure relief valve
12th	1st	Pressure regulation valve
	2nd	Direction control valve: 3/2 DCV, 5/2 DCV, 5/3 DCV
	3rd	Flow control valves, Throttle valves
	4th	Gear Pumps – Working principle and their uses. External and Internal gear pumps.
13th	1st	Vane pump – Working principle and uses
	2nd	Radial piston pump – Working principle and uses
	3rd	ISO symbols for hydraulic components
	4th	Actuators: Function, types, Working of Actuators
14th	1st	Hydraulic circuit – Control of single acting cylinder

	2nd	Hydraulic circuit – Operation of double acting cylinder
	3rd	Operation of double acting cylinder with Metering in and Metering out control
	4th	Comparison of hydraulic and pneumatic system
15th	1st	Review class
	2nd	*Assignment Evaluation & Class Test*
	3rd	Previous year Exam Question discussion
	4th	Possible Question and Answer Discussion

MkPatra 21/10/21
Signature of the Faculty