

# GOVT. POLYTECHNIC NAYAGARH

## DEPARTMENT OF MECHANICAL ENGINEERING

### LESSON PLAN

**SUBJECT:** HYDRAULIC MACHINES & INDUSTRIAL FLUID POWER LABORATORY (PR-2)  
**PERIODS:** 4P/WEEK

**SEMESTER:** 5<sup>th</sup>

**NAME OF FACULTY:** SANTOSH KUMAR PATRA (Gr. A), ABINAS NAYAK, (Gr. B)

**SEMESTER FROM :** 14/07/2024 to 15/11/2024

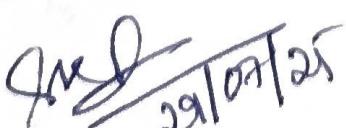
**NO. OF WEEKS:** 15

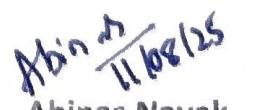
Week	Class Day	Theory / Practical Topics
1st	1st Period	Introduction to Hydraulic Machines & Lab Safety
	2nd Period	Performance test on impulse turbine – setup & procedure
2nd	1st Period	Conducting impulse turbine test – data collection
	2nd Period	Efficiency calculation of impulse turbine (Checking Lab Record with Viva Voce)
3rd	1st Period	Performance test on Kaplan turbine – setup & procedure
	2nd Period	Conducting Kaplan turbine test – data collection
4th	1st Period	Efficiency calculation of Kaplan turbine (Checking Lab Record with Viva Voce)
	2nd Period	Performance test on Francis turbine – setup & procedure
5th	1st Period	Conducting Francis turbine test – data collection
	2nd Period	Efficiency calculation of Francis turbine (Checking Lab Record with Viva Voce)
6th	1st Period	Performance test on centrifugal pump – setup & procedure
	2nd Period	Conducting centrifugal pump test – characteristic curves (Checking Lab Record with Viva Voce)
7th	1st Period	Direct operation of single acting pneumatic cylinder
	2nd Period	Direct operation of double acting pneumatic cylinder (Checking Lab Record with Viva Voce)
8th	1st Period	Operation of double acting pneumatic cylinder with quick exhaust valve
	2nd Period	Operation of double acting pneumatic cylinder with quick exhaust valve (Checking Lab Record with Viva Voce)
9th	1st Period	Speed control using metering in & metering out circuit
	2nd Period	Combined metering in & out circuit – analysis (Checking Lab Record with Viva Voce)
10th	1st Period	Direct operation of single acting hydraulic cylinder
	2nd Period	Direct operation of double acting hydraulic cylinder (Checking Lab Record with Viva Voce)
11th	1st Period	Direct operation of hydraulic motor

	2nd Period	Direct operation of hydraulic motor (Checking Lab Record with Viva Voce)
12th	1st Period	Speed control of hydraulic cylinder using metering in & metering out circuit
	2nd Period	Combined metering in & out circuit – hydraulic analysis (Checking Lab Record with Viva Voce)
13th	1st Period	Recap of turbine and pump experiments
	2nd Period	Recap of pneumatic circuit operations
14th	1st Period	Recap of hydraulic circuit operations
	2nd Period	Practice session – efficiency & performance calculations
15th	1st Period	Doubt clearance and viva preparation
	2nd Period	Final revision and feedback collection

#### REFERENCES:

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	

  
 Santosh Kumar Patra  
 Lecturer Stage I

  
 Abinas Nayak  
 Lecturer Stage I