

**BHUBANANANDA ODISHA SCHOOL OF ENGINEERING, CUTTACK
DEPARTMENT OF MECHANICAL ENGINEERING**



LESSON PLAN

SUBJECT: HYDRAULIC MACHINES & INDUSTRIAL FLUID POWER (TH 3)

FACULTY: Mrs. SUNITA NAYAK

Sunita Nayak

ACCADEMIC SESSION: 2024-25

SEMESTER: 5TH

SEC: A

[Signature]
H O D (Mechanical Engg.)

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Discipline: MECHANICAL Engineering		Semester: 5 Th A		Name of the teaching faculty: Mrs. SUNITA NAYAK	
Subject: HYDRAULIC MACHINES & INDUSTRIAL FLUID POWER		No. of Days/ per week class allotted: 04 periods per week (Wed-1 period, Thu-1 period, Fri -1 period, Sat-1 period)		Semester From Date: 01-07-2024 To Date: 08-11-2024 No. of weeks: 18 weeks	
Week	Class Day	No of period available	Theory Topics		
1 st	03/07/2024	1	Discussion of syllabus and fundamentals of fluid mechanics and its application		
	04/07/2024	1	1.Hydraulic Turbines		
	05/07/2024	1	1.1 Definition and classification of hydraulic turbines		
	06/07/2024	1	1.2 Construction of impulse turbine		
2 nd	10/07/2024	1	1.2 Working principle of impulse turbine		
	11/07/2024	1	1.3 Velocity diagram of moving blades		
	12/07/2024	1	1.3 Work done of impulse turbine		
	13/07/2024	1	1.3 Derivation of various efficiencies of impulse turbine		
3 rd	18/07/2024	1	1.3 Numerical on above		
	19/07/2024	1	1.3 Numerical on above		
	20/07/2024	1	1.4 Velocity diagram of moving blades and work done of Francis turbine		

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4 th	24/07/2024	1	1.4 Numerical on above
	25/07/2024	1	1.4 Numerical on above
	26/07/2024	1	1.5 Velocity diagram of moving blades and work done of Kaplan turbine
	27/07/2024	1	1.5 Derivation of various efficiencies of Kaplan turbine
5 th	31/07/2024	1	1.6 Numerical on above
	01/08/2024	1	1.6 Numerical on above
	02/08/2024	1	1.7 Distinguish between impulse turbine and reaction turbine
	03/08/2024	1	2. Centrifugal Pumps 2.1 Construction and working principle of centrifugal pumps
6 th	07/08/2024	1	2.2 Work done of centrifugal pumps
	08/08/2024	1	2.2 Derivation of various efficiencies of centrifugal pumps
	09/08/2024	1	2.3 Numerical on above
	10/08/2024	1	2.3 Numerical on above
7 th	14/08/2024	1	Class test-1
	16/08/2024	1	3. Reciprocating Pumps 3.1 Describe construction & working of single acting reciprocating pump
	17/08/2024	1	3.2 Describe construction & working of double acting reciprocating pump

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8 th	21/08/2024	1	3.3 Derive the formula for power required to drive the pump (Single acting)
	22/08/2024	1	3.3 Derive the formula for power required to drive the pump (Double acting)
	23/08/2024	1	3.5 Define slip, State positive & negative slip 3.5 Establish relation between slip & coefficient of discharge
	24/08/2024	1	3.6 Solve numerical on above
9 th	28/08/2024	1	3.6 Solve numerical on above
	29/08/2024	1	4. Pneumatic control system 4.1 Elements –filter-regulator-lubrication unit
	30/08/2024	1	4.2 Pressure control valves 4.2.1 Pressure relief valves, 4.2.2 Pressure regulation valves
	31/08/2024	1	4.3 Direction control valves 4.3.1 3/2DCV,5/2 DCV,5/3DCV
10 th	04/09/2024	1	4.3.1 3/2DCV,5/2 DCV,5/3DCV
	05/09/2024	1	4.3.1 3/2DCV,5/2 DCV,5/3DCV
	06/09/2024	1	4.3.2 Flow control valves,
11 th	11/09/2024	1	4.3.3. Throttle valves
	12/09/2024	1	4.4 ISO Symbols of pneumatic components
	13/09/2024	1	4.5. Pneumatic circuits 4.5.1 Direct control of single acting cylinder
	14/09/2024	1	4.5.2 Operation of double acting cylinder

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12 th	18/09/2024	1	4.5.3 Operation of double acting cylinder with metering in and metering out control,
	19/09/2024	1	4.5.3 Operation of double acting cylinder with metering in and metering out control
	20/09/2024	1	5. Hydraulic control system 5.1 Hydraulic system, its merit and demerits
	21/09/2024	1	5.2 Hydraulic accumulators
13 th	25/09/2024	1	5.2.1 Pressure control valves
	26/09/2024	1	5.2.2 Pressure relief valves 5.2.3 Pressure regulation valves
	27/09/2024	1	5.3 Direction control valves 5.3.1 3/2DCV,5/2 DCV,5/3DCV
	28/09/2024	1	5.3.1 3/2DCV,5/2 DCV,5/3DCV Hydraulic circuits
14 th	03/10/2024	1	5.3.2 Flow control valves,
	04/10/2024	1	5.3.3 Throttle valves
	05/10/2024	1	5.4 Fluid power pumps 5.4.1 External and internal gear pumps
15 th	17/10/2024	1	5.4.2 Vane pump 5.4.3 Radial piston pump
	18/10/2024	1	5.5 ISO Symbols for hydraulic components Monthly

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	19/10/2024	1	5.6 Actuators
16 th	23/10/2024	1	5.7 Hydraulic circuits
	24/10/2024	1	5.7.1 Direct control of single acting cylinder
	25/10/2024	1	5.7.2 Operation of double acting cylinder
	26/10/2024	1	5.7.3 Operation of double acting cylinder with metering in and metering out control
17 th	30/10/2024	1	5.7.3 Operation of double acting cylinder with metering in and metering out control
	01/11/2024	1	5.8 Comparison of hydraulic and pneumatic system
	02/11/2024	1	Revision
18 th	06/11/2024	1	Class test-2
	07/11/2024	1	Revision
	08/11/2024	1	Revision

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