

LESSON PLAN FOR FLUID MECHANICS & FLUID POWER

Discipline: Mechanical Engg Semester: 3rd Name of the Teaching Faculty: TRUPTI MOHANTY

Subject: FM&FP (TH-4) No. of Days/week class allotted=3 Semester From date: 14.07.2025 To Date: 15.11.2025

Week	Period	Topics To be Covered	Points To be discussed
1	1	Introduction to Fluid Mechanics	Definition, types (ideal/real, compressible/incompressible), relevance in engineering
	2	Properties of Fluids – I	Density, specific weight, specific gravity, pressure, compressibility
	3	Properties of Fluids – II	Viscosity, surface tension, cohesion & adhesion with examples
2	4	Hydrostatics – I	Pressure at a point, Pascal's law, measurement of pressure
	5	Hydrostatics – II	Total pressure, center of pressure on vertical/horizontal surfaces
	6	Hydrostatics – III	Center of pressure on inclined and curved surfaces
3	7	Manometers – I	Simple, differential, inverted manometers
	8	Manometers – II	Numerical problems on manometers
	9	Buoyancy & Flotation	Archimedes' principle, conditions for stability
4	10	Kinematics – I	Types of flow: steady/unsteady, uniform/non-uniform, laminar/turbulent
	11	Kinematics – II	Streamline, path line, streak line, flow net
	12	Dynamics – I	Bernoulli's theorem: derivation and assumptions
5	13	Dynamics – II	Applications of Bernoulli's (Venturimeter & Pitot tube)
	14	Dynamics – III	Numerical problems on Bernoulli's equation
	15	Flowmeters	Working of current meter and flowmeter types
6	16	Orifices & Notches – I	Orifices: definition, types, coefficients (C_c , C_v , C_d)
	17	Orifices & Notches – II	Rectangular and triangular notch discharge equations
	18	Pipe Flow – I	Definition, laws of fluid friction, head loss, Darcy's equation
7	19	Pipe Flow – II	Chezy's formula, hydraulic gradient & energy line
	20	Pipe Flow – III	Nozzles, power transmission through nozzles
	21	Pipe Flow – IV	Max power transmission condition, nozzle design
8	22	Review + Assignments	Review of Units I–III
	23	Feedback & Solution Discussion	Discuss errors and clarify concepts
	24	Hydraulic Turbines – I	Classification, head-based selection, introduction
9	25	Hydraulic Turbines – II	Pelton wheel: construction & working
	26	Hydraulic Turbines – III	Francis & Kaplan turbines, comparison
	27	Draft Tubes	Types, function, cavitation concept
10	28	Turbine Performance	Work done, power & efficiency (with problems)
	29	Centrifugal Pump – I	Working principle, components, multistage, priming
	30	Centrifugal Pump – II	Manometric head, efficiency formulas
11	31	Class Test 1	Based on Units I–III
	32	Reciprocating Pump – I	Working of single/double acting pumps
	33	Reciprocating Pump – II	Slip, negative slip, separation, efficiency
12	34	Fluid Power Systems – I	Definition, hydraulic vs pneumatic power
	35	Fluid Power Systems – II	Hydraulic system elements: reservoir, filters, valves
	36	Fluid Power Systems – III	Actuators, accumulators, pipelines, control valves
13	37	Hydraulic Circuits – I	Basic circuits for linear motion, rotary motion
	38	Hydraulic Circuits – II	Holding circuit, hydraulic press operation
	39	Class Test 2	Based on Units IV–V
14	40	Pneumatic Circuits	Pneumatic system layout, examples
	41	Review of Unit IV–V	Recap of turbines, pumps & circuits
	42	Discussion & Problem Solving	Detailed explanation of test solutions

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15	43	Final Review & Exam Prep – I	Common numericals, formula sheet creation	
	44	Final Review & Exam Prep – II	Mixed MCQs and application-based Q&A	
	45	Course Summary & Q&A	Open discussion, summary chart of syllabus	

Treupti Mohanty
Concerned faculty

Babu
11/07/2025
HOD Mechanical
Govt. Polytechnic Kandhamal