GOVT. POLYTECHNIC KANDHAMAL, (PHULBANI)

LESSON PLAN: FLUID MECHANICS AND FLUID POWER

3RD – SEMESTER, 2026 (W)

Discipline: **Mechanical Engineering**	Semester: **Winter 2026**	Name of the teaching faculty: **Snehasish Muduli**
Subject: **FM & FP**	No of days/per week class allotted: **03**	Semester From Date: **01.07.2026** To Date: **05.11.2026** No of weeks:**16**
Week:	Class day:	**Theory/practical topics:**
1ST	**1ST**	**Unit 1 (PROPERTIES OF A FLUID AND HYDROSTATICS)** Introduction Definition of a fluid, classification of fluids, various fluid properties such as density, specific weight, specific gravity, viscosity
	2ND	Surface tension and state the units, the principle of manometers of simple , differential and inverted types
	3RD	Simple numerical on Manometer
2ND	**1ST**	Simple numerical on Manometer
	2ND	Fluid pressure, total pressure (hydrostatic force)and location of centre of pressure on vertical, horizontal surface
	3RD	Total pressure (hydrostatic force)and location of centre of pressure on inclined and curved surfaces by fluid
3RD	**1ST**	Working of various measuring devices for pressure
	2ND	Principle of buoyancy and floatation
	3RD	Revision of Unit 1
4TH	**1ST**	**Unit 2 (KINEMATICS AND DYNAMICS OF FLUID MECHANICS)** Various types of flow, circulation and vorticity, stream-line, path line and streak-line
	2ND	Various energies of fluid, law of conservation of mass, energy equation - Bernoulli's theorem
	3RD	The limitations of same-application of Bernoulli's equation, the working of venturimeter, pitot tube,
5TH	**1ST**	Equation of flow rate and velocity with respect to venturimeter and pitot tube respectively
	2ND	The working of flowmeter: current meter, Simple numerical.

	3RD	Simple numerical
6TH	**1ST**	**Unit 3 (FLOW THROUGH ORIFICES AND NOTCHES, PIPES)** Definition –orifice, orifice coefficient such as Cc, Cv, Cd, Relationship between orifice coefficients,
	2ND	Weir and notch, Discharge over rectangular notch
	3RD	Discharge over rectangular weir, triangular notch. Simple numerical.
7TH	**1ST**	Simple numerical.
	2ND	Definition of a pipe. laws of fluid friction, Equation of loss of head through pipe due to friction,
	3RD	Darcy's formula and Chezy's formula, hydraulic gradient and total energy line, Nozzle and its application,
8TH	**1ST**	Power transmission through nozzle The condition of maximum power transmission through nozzle,
	2ND	Expression for diameter of nozzle for maximum power transmission. Simple numerical.
	3RD	Simple numerical.
9TH	**1ST**	**Unit 4 (Turbines and Pumps)** Classification of hydraulic turbines, Selection of turbine on the basis of head and discharge available, Construction and working principle of Pelton wheel,
	2ND	Construction and working principle of Francis and Kaplan turbines. Draft tubes – types and construction, Concept of cavitation in turbines,
	3RD	Calculation of Work done, Power, efficiency of turbines
10TH	**1ST**	Simple numerical
	2ND	Simple numerical
	3RD	**Centrifugal Pumps:** Principle of working and applications, Types of casings and impellers, Concept of multistage,
11TH	**1ST**	Priming and its methods, Manometric head, Work done, Manometric efficiency, Overall efficiency.
	2ND	Simple numerical
	3RD	Simple numerical

12TH	**1ST**	**Reciprocating Pumps:** Construction, working principle and applications of single and double acting reciprocating pumps,
	2ND	Concept of Slip, Negative slip, Cavitation and separation. Simple numerical
	3RD	Simple numerical
13TH	**1ST**	**Unit 5 (FLUID POWER)** Definition of fluid power, classification – hydraulic power and pneumatic power,
	2ND	Hydraulic Systems -Basic principle of enclosed hydraulic system – Pascal's law, Oil hydraulic system – reservoir,
	3RD	Filter pressure limiting valves, direction control valves, flow control valves,
14TH	**1ST**	Actuators (linear and rotary), accumulator, pipes and fittings,
	2ND	Various positive displacement pumps-gear, vane, piston,
	3RD	Drawing of hydraulic circuits - extension and retraction of linear actuator,
15TH	**1ST**	motion of rotary actuator, holding a job, hydraulic press etc.
	2ND	Revision of Unit 5
	3RD	Previous semester question discussion
16TH	**1ST**	Previous semester question discussion
	2ND	Previous semester question discussion
	3RD	Previous semester question discussion

Sign. of Faculty Concerned

Sign. of HOD