



GANAPATI INSTITUTE OF ENGINEERING & TECHNOLOGY (Polytechnic), JAGATPUR, CUTTACK
DEPARTMENT OF MECHANICAL ENGINEERING.
LESSON PLAN-2026 WINTER

Discipline: MECHANICAL ENGG	Semester: 3RD	Name of the Teaching Faculty: SUBHRANSU SEKHAR BARIK
Subject: FLUID MECHANICS & FLUID POWER [MEPC-207 Th:4]	No. of days/per week class allotted: 03	Semester From date: 01.07.2026 To Date : 05.11.2026 No. of Weeks: 15
Week	Class Day	Theory/Practical Topics
1 ST	1 ST	1.0 PROPERTIES OF A FLUID AND HYDROSTATICS: Definition of a fluid, classification of fluids,
	2 ND	Various fluid properties such as density, specific weight, specific gravity, viscosity and surface tension and state the units,
	3 RD	Various fluid properties such as density, specific weight, specific gravity, viscosity and surface tension and state the units,
2 ND	1 ST	Fluid pressure, total pressure (hydrostatic force)and location of centre of pressure on vertical, horizontal by fluid
	2 ND	Total pressure (hydrostatic force)and location of centre centre of pressure on inclined and curved surfaces by fluid
	3 RD	Working of various measuring devices for pressure, the principle of simple manometers. Simple numericals
3 RD	1 ST	Working of various measuring devices for pressure, the principle of differential manometers. Simple numericals
	2 ND	Working of various measuring devices for pressure, the principle of inverted type manometers. Simple numericals
	3 RD	Principle of buoyancy and floatation.
4 TH	1 ST	2.0 KINEMATICS AND DYNAMICS OF FLUID MECHANICS Various types of flow, circulation and vorticity, stream-line, path line and streak-line, various energies of fluid.
	2 ND	Law of conservation of mass. Simple numericals.
	3 RD	Energy equation -Bernoulli's theorem, the limitations of same-application of Bernoulli's equation.
5 TH	1 ST	Simple numerical on Bernoulli's theorem.
	2 ND	The working of venturimeter, pitot tube, equation of flow rate and velocity with respect to venturimeter and pitot tube respectively. Simple numerical
	3 RD	The working of flow meter: current meter. Simple numerical.
6 TH	1 ST	3.0:-FLOW THROUGH ORIFICES AND NOTCHES,PIPES: Definition-orifice,Orifice coefficient such as Cc, Cv, Cd.
	2 ND	Relationship between orifice coefficients, weir and notch.

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	3 RD	Discharge over rectangular notch and weir, triangular notch. Simple numericals.
7 TH	1 ST	Definition of a pipe. laws of fluid friction, Equation of loss of head through pipe due to friction, Darcy's formula and Chezy's formula.
	2 ND	Equation of loss of head through pipe due to friction, Chezy's formula.
	3 RD	Hydraulic gradient and total energy line, Nozzle and its application.
8 TH	1 ST	Power transmission through nozzle The condition of maximum power transmission through nozzle.
	2 ND	Expression for diameter of nozzle for Maximum power transmission.
	3 RD	Simple numericals.
9 TH	1 ST	4.0 Turbines and Pumps: Classification of hydraulic turbines and pumps.
	2 ND	Selection of turbine on the basis of head and discharge available.
	3 RD	Construction and working principle of Pelton wheel.
10 TH	1 ST	Calculation of Work done, Power, efficiency of turbines. Simple numerical.
	2 ND	Construction and working principle of Francis and Kaplan turbines.
	3 RD	Calculation of Work done, Power, efficiency of turbines. Simple numerical.
11 TH	1 ST	Draft tubes – types and construction, Concept of cavitation in turbines.
	2 ND	Centrifugal Pumps: Principle of working and applications, Types of casings and impellers.
	3 RD	Concept of multistage, Priming and its methods, Manometric head.
12 TH	1 ST	Work done, Manometric efficiency, Overall efficiency. Simple numerical.
	2 ND	Reciprocating Pumps: Construction, working principle and applications of single acting reciprocating pumps, Concept of Slip, Negative slip,. Simple numerical.
	3 RD	Construction, working principle and applications of double acting reciprocating pumps, Cavitation and separation. Simple numerical.
13 TH	1 ST	5.0:- FLUID POWER: Definition of fluid power, classification – hydraulic power and pneumatic power.
	2 ND	Hydraulic Systems –Basic principle of enclosed hydraulic system – Pascal's law.
	3 RD	Oil hydraulic system–reservoir, filter pressure limiting valves.
14 TH	1 ST	Direction control valves, flow control valves.
	2 ND	Actuators (linear and rotary), accumulator, pipes and fittings.
	3 RD	Various positive displacement pumps-gear, vane, piston.
15 TH	1 ST	Drawing of hydraulic circuits - extension and retraction of linear actuator.
	2 ND	Drawing of hydraulic circuits - motion of rotary actuator.
	3 RD	Drawing of hydraulic circuits - holding a job, hydraulic press etc.

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Learning Resources:

S. No.	Name of the Book	Author Name	Publisher
01	Fluid Mechanics and Hydraulic Machines	R. K. Bansal	Laxmi
02	Fluid Mechanics and Hydraulic Machines	S. K. Ramu	Channa
03	Fluid Power with Applications	Anthony F. Foshee	Pearson Education Inc.
04	Hydraulics and Fluid Mechanics	Bagodiak Lal	Metropolitan Book
05	Hydraulic fluid mechanics and fluid machines	S. Ramamurtham	Chengat Ray and Sons

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