

BHUBANANANDA ODISHA SCHOOL OF ENGINEERING, CUTTACK
DEPARTMENT OF MECHANICAL ENGINEERING



LESSON PLAN

SUBJECT- FLUID MECHANICS & FLUID POWER

FACULTY: MRS SUNITA SAMAL

ACADEMIC SESSION: 2026-27(W)

SEMESTER: 3RD

SEC: B

Sd/-

H O D (Mech.Engg.)

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COURSE OUTCOMES

- C204.1** Identify the properties of a fluid and hydrostatics.
- C204.2** Explain the basic kinematics and dynamics of fluid mechanics
- C204.3** Describe the flow through orifices, notches and pipes.
- C204.4** Classify different types of turbines and pumps.
- C204.5** Apply the knowledge of fluid power.

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Discipline: Mechanical Engineering	Semester: 3RD /B		Name of the Teaching faculty: Mrs SUNITA SAMAL
Subject: Fluid Mechanics & Fluid power (TH-4)	No. of Days/ per week class allotted: 03 Periods per week		Semester From Date: 01-07-2026 To Date: 05-11-2026 No. of weeks: 19 weeks
Week	Class Day	No of periods available	Theory Topics
1ST	1st	1	UNIT-I PROPERTIES OF A FLUID AND HYDROSTATICS: Definition of a fluid, classification of fluids,
	2nd	1	Various fluid properties such as density, specific weight, specific gravity, viscosity and surface tension and state the units,
	3rd	1	Fluid pressure, total pressure (hydrostatic force) and location of centre of pressure on vertical, horizontal , inclined and curved surfaces by fluid
2ND	1st	1	Fluid pressure, total pressure (hydrostatic force) and location of centre of pressure on vertical, horizontal , inclined and curved surfaces by fluid
	2nd	1	Working of various measuring devices for pressure,
	3rd	1	The principle of manometers of simple, differential and inverted types
3RD	1st	1	Principle of buoyancy and floatation
	2nd	1	Simple numericals on Manometer .
	3rd	1	Simple numericals on Manometer.

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4 TH	1st	1	UNIT-II KINEMATICS AND DYNAMICS OF FLUID MECHANICS Various types of flow
	2nd	1	Circulation and vorticity, stream-line, path line and streak-line
	3rd	1	Various energies of fluid, law of conservation of mass, energy equation -Bernoulli's theorem, the limitations of same-application of Bernoulli's equation, the
5 TH	1st	1	Various energies of fluid, law of conservation of mass, energy equation -Bernoulli's theorem, the limitations of same-application of Bernoulli's equation, the
	2nd	1	The working of venturimeter, pitot tube, equation of flow rate and velocity with respect to venturimeter and pitot tube respectively .
	3rd	1	The working of venturimeter, pitot tube, equation of flow rate and velocity with respect to venturimeter and pitot tube respectively
6 TH	1st	1	The working of flow meter: current meter
	2nd	1	Simple numerical.
	3rd	1	Simple numerical.
7 TH	1st	1	Class Test-I
	2nd	1	UNIT-III FLOW THROUGH ORIFICES AND NOTCHES, PIPES: Definition–orifice, orifice coefficient such as C _c , C _v , C _d , Relationship between orifice coefficients
	3rd	1	weir and notch,
8 TH	1st	1	Discharge over rectangular notch and weir, triangular notch.
	2nd	1	Simple numerical.
	3rd	1	Definition of a pipe. laws of fluid friction

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9 TH	1st	1	Equation of loss of head through pipe due to friction, Darcy's formula and Chezy's formula
	2nd	1	Hydraulic gradient and total energy line,
	3rd	1	Nozzle and its application, Power transmission through nozzle
10 TH	1st	1	The condition of maximum power transmission through nozzle
	2nd	1	Expression for diameter of nozzle for maximum power transmission
	3rd	1	INTERNAL ASSESSMENT-I
11 TH	1st	1	UNIT-IV Turbines and Pumps: Classification of hydraulic turbines, Selection of turbine on the basis of head and discharge available
	2nd	1	Construction and working principle of Pelton wheel, Francis and Kaplan turbines
	3rd	1	Construction and working principle of Pelton wheel, Francis and Kaplan turbines
12 TH	1st	1	Construction and working principle of Pelton wheel, Francis and Kaplan turbines
	2nd	1	Draft tubes – types and construction
	3rd	1	Concept of cavitation in turbines,
13 TH	1st	1	Calculation of Work done, Power, efficiency of turbines. Simple numericals
	2nd	1	Calculation of Work done, Power, efficiency of turbines. Simple numericals
	3rd	1	Centrifugal Pumps: Principle of working and applications
14 TH	1st	1	Types of casings and impellers, Concept of multistage,
	2nd	1	Priming and its methods
	3rd	1	Manometric head, Work done, Manometric efficiency, Overall efficiency

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15 TH	1st	1	Simple numericals
	2nd	1	Reciprocating Pumps: Construction, working principle and applications of single and double acting reciprocating pumps,
	3rd	1	Construction, working principle and applications of single and double acting reciprocating pumps,
16 TH	1st	1	Concept of Slip, Negative slip, Cavitation and separation. Simple numericals
	2nd	1	UNIT-V FLUID POWER: Definition of fluid power, classification – hydraulic power and pneumatic power,
	3rd	1	Hydraulic Systems -Basic principle of enclosed hydraulic system – Pascal's law,
17 TH	1st	1	Oil hydraulic system – reservoir, filter pressure limiting valves, direction control valves,
	2nd	1	flow control valves, actuators (linear and rotary), accumulator, pipes and fittings,
	3rd	1	Various positive displacement pumps-gear, vane, piston
18 TH	1st	1	Drawing of hydraulic circuits - extension and retraction of linear actuator
	2nd	1	Motion of rotary actuator, holding a job, hydraulic press etc
	3rd	1	Motion of rotary actuator, holding a job, hydraulic press etc
19 TH	1st	1	INTERNAL ASSESSMENT-I
	2nd	1	REVISION
	3rd	1	PREVIOUS YEAR QUESTION DISCUSSION

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