GOVERNMENT POLYTECHNIC, NABARANGPUR

DEPARTMENT OF MECHANICAL ENGINEERING

Discipline: **MECHANICAL ENGG.**	Semester: 4TH	Name of the Teaching Faculty: Sri Deepak Ranjan Pattnaik
Subject: **FLUID MECHANICS (TH.3)**	No. of days/per week class allotted: 04	Semester From date: 04.02.2025 To Date:17.05.2025 No. of Weeks: 15
COURSE OUTCOMES	**CO1: Comprehending fluid properties and their measurements.** **CO2: Realizing conditions for floatation.** **CO3: Applying Continuity Equation & Bernoulli's theorem.** **CO4:Flow through Orifice, Notches, Weirs and pipes.**	

Week	Class Day	Theory/Practical Topics
1ST	1ST	**PROPERTIES OF FLUID** Define fluid.
	2ND	Define fluid (Contd…)
	3RD	Description of fluid properties like Density, Specific weight, specific gravity, specific volume and solve simple problems.
	4TH	Description of fluid properties like Density, Specific weight, specific gravity, specific volume and solve simple problems (Contd…)
2ND	1ST	Description of fluid properties like Density, Specific weight, specific gravity, specific volume and solve simple problems (Contd…)
	2ND	Definitions and Units of Dynamic viscosity, kinematic viscosity, surface tension Capillary phenomenon.
	3RD	Definitions and Units of Dynamic viscosity, kinematic viscosity, surface tension Capillary phenomenon (Contd…)
	4TH	QUIZ & ASSIGNMENT
3RD	1ST	**FLUID PRESSURE AND ITS MEASUREMENTS** Definitions and units of fluid pressure, pressure intensity and pressure head.
	2ND	Definitions and units of fluid pressure, pressure intensity and pressure head (Contd…)
	3RD	Statement of Pascal's Law.
	4TH	Concept of atmospheric pressure, gauge pressure, vacuum pressure and absolute pressure.
4TH	1ST	Pressure measuring instruments Manometers (Simple and Differential)
	2ND	Pressure measuring instruments Manometers (Simple and Differential) (Contd…)
	3RD	Bourdon tube pressure gauge(Simple Numerical)
	4TH	Solve simple problems on Manometer.
5TH	1ST	**HYDROSTATICS** Definition of hydrostatic pressure.
	2ND	Total pressure and centre of pressure on immersed bodies(Horizontal and Vertical Bodies).
	3RD	Total pressure and centre of pressure on immersed bodies(Horizontal and Vertical Bodies) , Solve Simple problems.
	4TH	QUIZ & ASSIGNMENT
6TH	1ST	Solve Simple problems (Contd…)
	2ND	Archimedes 'principle, concept of buoyancy, meta center and meta centric

		height (Definition only)
	3RD	Concept of floatation.
	4TH	QUIZ & ASSIGNMENT
7TH	1ST	**KINEMATICS OF FLOW** Types of fluid flow
	2ND	Types of fluid flow (Contd…)
	3RD	Continuity equation(Statement and proof for one dimensional flow)
	4TH	Continuity equation (Statement and proof for one dimensional flow) (Contd…)
8TH	1ST	Bernoulli's theorem(Statement and proof) Applications and limitations of Bernoulli's theorem (Venturimeter, pitot tube)
	2ND	Bernoulli's theorem (Statement and proof) Applications and limitations of Bernoulli's theorem (Venturimeter, pitot tube) (Contd…)
	3RD	Bernoulli's theorem (Statement and proof) Applications and limitations of Bernoulli's theorem (Venturimeter, pitot tube) , Solve simple problems.
	4TH	QUIZ & ASSIGNMENT
9TH	1ST	**ORIFICES, NOTCHES & WEIRS** Define orifice.
	2ND	Flow through orifice.
	3RD	Orifices coefficient & the relation between the orifice coefficients.
	4TH	Classifications of notches & weirs.
10TH	1ST	Discharge over a rectangular notch or weir.
	2ND	Discharge over a triangular notch or weir.
	3RD	Simple problems on above.
	4TH	QUIZ & ASSIGNMENT
11TH	1ST	**FLOW THROUGH PIPE** Definition of pipe.
	2ND	Loss of energy in pipes.
	3RD	Loss of energy in pipes (Contd…)
	4TH	Loss of energy in pipes (Contd…)
12TH	1ST	Head loss due to friction: Darcy's and Chezy's formula (Expression only)
	2ND	Head loss due to friction: Darcy's and Chezy's formula (Expression only) (Contd…)
	3RD	Solve Problems using Darcy's and Chezy's formula.
	4TH	QUIZ & ASSIGNMENT
13TH	1ST	Solve Problems using Darcy's and Chezy's formula (Contd…)
	2ND	Hydraulic gradient and total gradient line.
	3RD	**IMPACT OF JETS** Impact of jet on fixed and moving vertical flat plates.
	4TH	Impact of jet on fixed and moving vertical flat plates (Contd…)
14TH	1ST	Impact of jet on fixed and moving vertical flat plates (Contd…)
	2ND	Derivation of work done on series of vanes and condition for maximum efficiency.
	3RD	Derivation of work done on series of vanes and condition for maximum efficiency
	4TH	QUIZ & ASSIGNMENT
15TH	1ST	Impact of jet on moving curved vanes, illustration using velocity triangles, derivation of work done, efficiency.
	2ND	Impact of jet on moving curved vanes, illustration using velocity triangles, derivation of work done, efficiency (Contd…)
	3RD	Impact of jet on moving curved vanes, illustration using velocity triangles, derivation of work done, efficiency (Contd…)
	4TH	Simple problems on above.

01. Text Book of Fluid Mechanics R.K.Bansal Laxmi
02. Text Book of Fluid Mechanics R.S khurmi S.Chand
03. Text Book of Fluid Mechanics R.K.Rajput S.Chand
04. Text Book of Fluid Mechanics Modi & Seth Rajson's pub. Pvt. lt

Deepak Kr. Pattnaik
24.01.2025
Sign. Of Faculty
Concerned

Sign. Of HOD/C

Academic Coordinator

Principal
7.2.25