

TH 3

## GOVT. POLYTECHNIC, DHENKANAL,

LESSON PLAN: FLUID MECHANICS, 4<sup>TH</sup> – SEMESTER, 2024-25

Discipline: Mechanical Engineering	Semester: Summer 2025	Name of the teaching faculty: PRADEEP KUMAR JENA
Subject: FM	No of days/per week class allotted: 04	Semester From Date: 04.02.2025 To Date: 17.05.2025 No of weeks: 15
Week:	Class day:	Theory/practical topics:
1 <sup>ST</sup>	1 <sup>ST</sup>	<b>Unit 1 (Properties of Fluid)</b> Introduction 1.1 Define fluid  1.2 Description of fluid properties like Density, Specific weight, specific gravity, specific volume
	2 <sup>ND</sup>	Solve simple problems.
	3 <sup>RD</sup>	Solve simple problems.
	4 <sup>TH</sup>	1.3 Definitions and Units of Dynamic viscosity, kinematic viscosity,
2 <sup>ND</sup>	1 <sup>ST</sup>	1.3 surface tension Capillary phenomenon
	2 <sup>ND</sup>	Solve simple problems.
	3 <sup>RD</sup>	Solve simple problems
	4 <sup>TH</sup>	Revision of Unit 1 & Previous semester question discussion
3 <sup>RD</sup>	1 <sup>ST</sup>	<b>Unit 2 (Fluid Pressure and its measurements)</b> 2.1 Definitions and units of fluid pressure, pressure intensity and pressure head
	2 <sup>ND</sup>	2.2 Statement of Pascal's Law.  2.3 Concept of atmospheric pressure, gauge pressure, vacuum pressure and absolute pressure
	3 <sup>RD</sup>	2.4 Pressure measuring instruments Manometers (Simple and Differential)
	4 <sup>TH</sup>	2.4 Pressure measuring instruments Manometers (Simple and Differential)
4 <sup>TH</sup>	1 <sup>ST</sup>	2.4.1 Bourdon tube pressure gauge



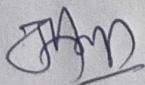
	2 <sup>ND</sup>	Simple Numerical
	3 <sup>RD</sup>	Simple Numerical
	4 <sup>TH</sup>	Revision of Unit 2 & Previous semester question discussion
5 <sup>TH</sup>	1 <sup>ST</sup>	<b>Unit 3 (Hydrostatics)</b> Introduction 3.1 Definition of hydrostatic pressure 3.2 Total pressure and centre of pressure on immersed bodies (Horizontal and Vertical Bodies)
	2 <sup>ND</sup>	3.2 Total pressure and centre of pressure on immersed bodies (Horizontal and Vertical Bodies)
	3 <sup>RD</sup>	3.3 Solve Simple problems.
	4 <sup>TH</sup>	3.3 Solve Simple problems.
6 <sup>TH</sup>	1 <sup>ST</sup>	3.4 Archimedes' principle, concept of buoyancy, meta center and meta centric height (Definition only)
	2 <sup>ND</sup>	3.5 Concept of floatation
	3 <sup>RD</sup>	Solve Simple problems.
	4 <sup>TH</sup>	Revision of Unit 3 & Previous semester question discussion
7 <sup>TH</sup>	1 <sup>ST</sup>	<b>Unit 4 (Kinematics of Flow)</b> Introduction 4.1 Types of fluid flow
	2 <sup>ND</sup>	4.2 Continuity equation (Statement and proof for one dimensional flow)
	3 <sup>RD</sup>	4.3 Bernoulli's theorem (Statement and proof)
	4 <sup>TH</sup>	4.3 Applications and limitations of Bernoulli's theorem (Venturimeter, pitot tube)
8 <sup>TH</sup>	1 <sup>ST</sup>	4.3 Applications and limitations of Bernoulli's theorem (Venturimeter, pitot tube)
	2 <sup>ND</sup>	4.4 Solve simple problems
	3 <sup>RD</sup>	4.4 Solve simple problems



	4 <sup>TH</sup>	Revision of Unit 4 & Previous semester question discussion
9 <sup>TH</sup>	1 <sup>ST</sup>	Unit 5 (Orifices, notches & weirs) Introduction 5.1 Define orifice 5.2 Flow through orifice 5.3 Orifices coefficient
	2 <sup>ND</sup>	5.3 relation between the orifice coefficients
	3 <sup>RD</sup>	5.4 Classifications of notches & weirs
	4 <sup>TH</sup>	5.5 Discharge over a rectangular notch or weir
10 <sup>TH</sup>	1 <sup>ST</sup>	5.6 Discharge over a triangular notch or weir
	2 <sup>ND</sup>	5.7 Simple problems on above
	3 <sup>RD</sup>	5.7 Simple problems on above
	4 <sup>TH</sup>	Revision of Unit 5 & Previous semester question discussion
11 <sup>TH</sup>	1 <sup>ST</sup>	Unit 6 (Flow through pipe) Introduction 6.1 Definition of pipe. 6.2 Loss of energy in pipes.
	2 <sup>ND</sup>	6.3 Head loss due to friction: Darcy's and Chezy's formula (Expression only)
	3 <sup>RD</sup>	6.4 Solve Problems using Darcy's
	4 <sup>TH</sup>	6.4 Solve Problems using Chezy's formula
12 <sup>TH</sup>	1 <sup>ST</sup>	6.4 Solve Problems using Darcy's and Chezy's formula.
	2 <sup>ND</sup>	6.5 Hydraulic gradient and total gradient line
	3 <sup>RD</sup>	6.4 Solve Problems using Darcy's and Chezy's formula.
	4 <sup>TH</sup>	6.4 Solve Problems using Darcy's and Chezy's formula.
13 <sup>TH</sup>	1 <sup>ST</sup>	Revision of Unit 6 & Previous semester question discussion



	2 <sup>ND</sup>	Unit 7 (Impact of jets) Introduction 7.1 Impact of jet on fixed and moving vertical flat plates
	3 <sup>RD</sup>	7.1 Impact of jet on fixed and moving Curved flat plates
	4 <sup>TH</sup>	7.1 Impact of jet on fixed and moving Curved flat plates
14 <sup>TH</sup>	1 <sup>ST</sup>	7.2 Derivation of work done on series of vanes
	2 <sup>ND</sup>	7.2 Derivation of condition for maximum efficiency
	3 <sup>RD</sup>	7.3 Illustration using velocity triangles
	4 <sup>TH</sup>	7.3 Derivation of work done, efficiency
15 <sup>TH</sup>	1 <sup>ST</sup>	Simple problems on above
	2 <sup>ND</sup>	Simple problems on above
	3 <sup>RD</sup>	Revision of Unit 7 & Previous semester question discussion
	4 <sup>TH</sup>	Previous semester question discussion



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