

**LESSON PLAN**  
**GIET(Polytechnic), Jagatpur, Cuttack, Odisha-754200**

Discipline : <b>MECHANICAL ENGG</b>	Semester : <b>4<sup>TH</sup></b>	Name of the Teaching Faculty: R. R. Lenka
Subject: <b>FLUID MECHANICS (Th-3)</b>	No. of days/per week class allotted: <b>04</b>	Semester From Date: <b>14.02.2023</b> To Date: <b>23.05.2023</b> No. of Weeks: <b>15</b>
<b>Week</b>	<b>Class Day</b>	<b>Theory Topics</b>
1 <sup>ST</sup>	1 <sup>ST</sup>	<b>1.0 Properties of Fluid</b> Introduction about fluid mechanics and hydraulic Machines.
	2 <sup>ND</sup>	Define Fluid, Examples of fluid, and Properties of fluid.
	3 <sup>RD</sup>	Definitions and Units of Density, Specific weight, specific gravity
	4 <sup>TH</sup>	Simple problem solved
2 <sup>ND</sup>	1 <sup>ST</sup>	Definitions and Units of specific gravity, specific Volume, solving of simple problems.
	2 <sup>ND</sup>	Definitions and Units of Dynamic viscosity, kinematic Viscosity.
	3 <sup>RD</sup>	Definitions and Units of surface tension, Capillary Phenomenon, Examples of capillary action
	4 <sup>TH</sup>	Application of capillary action and simple problem solved
3 <sup>RD</sup>	1 <sup>ST</sup>	<b>2.0 Fluid Pressure and its Measurements</b> Definitions and units of fluid pressure, pressure intensity and pressure head, Statement of Pascal Law
	2 <sup>ND</sup>	Concept of atmospheric pressure, gauge pressure Concept of vacuum pressure and absolute pressure, and their relationship
	3 <sup>RD</sup>	Describe about various Pressure measuring instruments and their application.
	4 <sup>TH</sup>	Describe about Manometers: Simple and differential type
4 <sup>TH</sup>	1 <sup>ST</sup>	Describe about Bourdon tube pressure gauge
	2 <sup>ND</sup>	Simple problems of Simple and differential manometer
	3 <sup>RD</sup>	Simple problems of Bourdon tube pressure gauge, Simple Numerical problems.
	4 <sup>TH</sup>	Solving of Simple problems on Manometer, SCTE&VT Questions Solved
5 <sup>TH</sup>	1 <sup>ST</sup>	<b>3.0 Hydrostatics</b> Definition of hydrostatic pressure
	2 <sup>ND</sup>	Discuss about Total pressure and center of pressure on immersed bodies (Horizontal and Vertical Bodies)
	3 <sup>RD</sup>	Simple Numerical problem solved of Total pressure and center of pressure on immersed bodies.
	4 <sup>TH</sup>	Discuss about Archimedes' principle, 1 <sup>st</sup> Monthly Test
6 <sup>TH</sup>	1 <sup>ST</sup>	Discuss about concept of buoyancy,
	2 <sup>ND</sup>	discuss about metacenter, Discuss about metacentric height
	3 <sup>RD</sup>	Discuss about the Concept of floatation
	4 <sup>TH</sup>	Concept of floatation, Flotation of Bodies Examples, simple Problems solved. Q & A discussion As per SCTE&VT Exam

7 <sup>TH</sup>	1 <sup>ST</sup>	<b>4.0 Kinematics of Flow</b> Define fluid flow and Types of fluid flow
	2 <sup>ND</sup>	Discuss about Continuity equation (Statement and proof for one dimensional flow)
	3 <sup>RD</sup>	State & proof Bernoulli's theorem
	4 <sup>TH</sup>	Applications and limitations of Bernoulli's theorem
8 <sup>TH</sup>	1 <sup>ST</sup>	Discuss about Venturi meter, Application and limitations
	2 <sup>ND</sup>	Simple numerical solved
	3 <sup>RD</sup>	Discuss about pitot tube and its application
	4 <sup>TH</sup>	Simple numerical solved
9 <sup>TH</sup>	1 <sup>ST</sup>	<b>5.0 Orifices, Notches &amp; Weirs</b> Definition of orifices, Flow through orifices
	2 <sup>ND</sup>	Orifice coefficients
	3 <sup>RD</sup>	Discuss Cc, Cv, Cd and relation among them
	4 <sup>TH</sup>	Classification of notches and weirs, 2 <sup>nd</sup> Monthly Test
10 <sup>TH</sup>	1 <sup>ST</sup>	Discharge over a rectangular notch or weir
	2 <sup>ND</sup>	Discharge over a triangular notch or weir
	3 <sup>RD</sup>	Simple problem solved on rectangular notch
	4 <sup>TH</sup>	Simple problem solved on triangular notch
11 <sup>TH</sup>	1 <sup>ST</sup>	<b>6.0 Flow through Pipes</b> Definition of pipe, Discuss Flow through pipe
	2 <sup>ND</sup>	Loss of Energy in pipes
	3 <sup>RD</sup>	Define laws of fluid friction
	4 <sup>TH</sup>	Head loss due to friction: Darcy's formula
12 <sup>TH</sup>	1 <sup>ST</sup>	Continued...
	2 <sup>ND</sup>	Head loss due to friction: Chezy's formula
	3 <sup>RD</sup>	Continued
	4 <sup>TH</sup>	Problem solved using Darcy's Formula
13 <sup>TH</sup>	1 <sup>ST</sup>	Problem solved using Chezy's Formula
	2 <sup>ND</sup>	Define Hydraulic gradient, Define total gradient line
	3 <sup>RD</sup>	<b>7.0 Impact of Jets</b> Define impact of jets
	4 <sup>TH</sup>	Discuss about various types of impact of jets
14 <sup>TH</sup>	1 <sup>ST</sup>	Discuss about Impact of jet on fixed and moving vertical flat plates
	2 <sup>ND</sup>	Discuss about derivation of work done on series of vanes
	3 <sup>RD</sup>	Discuss about condition for maximum efficiency
	4 <sup>TH</sup>	Discuss about Impact of jet on moving curved vanes
15 <sup>TH</sup>	1 <sup>ST</sup>	Discuss about illustration using velocity triangles
	2 <sup>ND</sup>	Discuss about derivation of work done, efficiency
	3 <sup>RD</sup>	Problem solved as per SCTE & VT question paper, 3 <sup>rd</sup> Monthly Test
	4 <sup>TH</sup>	Problem solved, Revision of previous chapter Taught

### Learning Resources:

<u>Text</u>	<u>Title of Book</u>	<u>Author</u>
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#### Books:

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| ➤ Fluid Mechanics and Hydraulic Machines | R .K. Bansal |
| ➤ Text Book of Fluid Mechanics           | R.S. Khurmi  |
| ➤ Text Book of Fluid Mechanics           | R.K. Rajput  |

<b>Reference</b>	Hydraulics, Fluid mechanics and Fluid machines Hydraulics and fluid mechanics including hydraulic machines	S Ramanurathan Modi and Seth
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