

**GOVERNMENT POLYTECHNIC, KENDRAPARA**  
**LESSON PLAN**

Semester-4<sup>th</sup>

Branch-Mechanical Engineering

Name of the Faculty- Ashok Kumar Biswal

Academic Session – 2022-2023

Subject-Fluid mechanics  
Theory-3

Period	Unit/SI.no.	Topics to be covered
1	<b>Module-01</b>	<b>Properties of fluid:-</b> Introduction of Fluid & examples of fluid
2		Fluid properties like Density, specific weight, Relationship between Density and specific weight, specific volume ,specific gravity
3		Calculations on fluid properties
4		Viscosity, Different types of viscosity
5		Newton's law of viscosity
6		surface tension and capillary
7		Calculations based on viscosity
8		<b>Unit Discussion</b>
9	<b>Module-02</b>	<b>Fluid pressure and Its measurements-</b> Introduction to fluid pressure
10		Pressure intensity and pressure head
11		Calculations based on fluid pressure and pressure head
12		Pascal's law, Concepts of atmospheric pressure
13		Gauge pressure, Vacuum pressure and Absolute pressure
14		Derivation of relationship between atmospheric pressure, Gauge pressure and absolute pressure.
15		Simple and differential manometers & Bourdon tube pressure gauge
16		Calculations based on Manometers
17	<b>OMR-1</b>	
18	<b>Module-03</b>	<b>Hydrostatics-</b> Introduction to Hydrostatic pressure with its examples
19		Total pressure- on immersed bodies and vertical bodies
20		Centre of pressure on horizontal and vertical bodies
21		Calculation based on total pressure and center of pressure
22		Archimedes principle ,Concept of Buoyancy, Metacenter
23		Metacentric Height, Concept of Floatation, Calculations based on metacentric height
24		<b>OMR-2</b>
25	<b>Module-04</b>	<b>Kinematics of flow-</b> Different types of fluid flows like steady and unsteady flow, uniform and non-uniform flow
26		Compressible flow and incompressible flow, turbulent flow, Laminar flow, rotational and irrotational flow
27		Derivation of Continuity equation & Bernoulli theorem, Limitations of Bernoulli's theorem
28		Derivation of Discharge formula of Venturimeter
29		Explain pitot tube and derive velocity through pitot tube
30		Calculations based on Bernoulli's theorem
31		<b>Class test-1</b>
32		<b>Unit Discussion</b>
33	<b>Module-05</b>	<b>Orifices, Notches and weirs-</b> Introduction to orifice and types of orifice
33		Flow through different types of orifice
34		Coefficient orifice and relation between orifice coefficient
35		Notch & Weir ,Classification of Notches and weirs
36		Derivation of discharge over a rectangular Notch and weir
37	Derivation of discharge over a triangular notch and weir	

38		Calculation based on orifice and notches
39		<b>REVISION</b>
40	<b>Module-06</b>	<b>Flow through pipe:</b> Introduction to flow through of pipes
41		Losses of energy in pipes
42		Head loss due to friction Darcy's formula
43		Head loss due to friction Chezy's formula
44		Calculations based on Darcy's formula
45		Calculations based on Chezy's formula
46		Hydraulic gradient line ,Total energy line
47		Calculations based on hydraulic gradient line & total energy line
48		<b>Unit Discussion</b>
49		<b>REVISION</b>
50		<b>Module -07</b>
51	Force exerted by the jet on a stationary vertical plate & moving vertical plate	
52	Derivation of work done on series of vanes	
53	Derivation of condition for maximum efficiency	
54	Impact of jet on moving curved vanes	
55	Illustration using velocity triangles	
56	Derivation of work done on impact of jet on moving curved vanes	
57	Derivation of efficiency of impact of jet on moving curved vanes	
58	Calculations based on impact of jet	
59	<b>CLASS TEST-2</b>	
60	<b>REVISION</b>	