Utkalmani Gopabandhu Institute of engineering, Rourkela
Department of mechanical Engineering
LESSON PLAN

Session :: Summer – 2023

Semester date::19/01/23 to 28/04/23

Course Type :: Theory

Semester/Branch :: 4th Semester, Mechanical Engineering

Subject (with code) :: Fluid Mechanics (Th-3)

Contact hours/week :: 4

Name of Faculty :: Kalebar Singh

Week	Class Day	Theory/Practical Topics
1st	1st	**Properties of fluid**: Definition and units of fluid properties like density, specific weight, specific volume and specific gravity.
	2nd	Numerical
	3rd	Definition and units of fluid properties such as viscosity, kinematic viscosity.
	4th	surface tension and capillarity
2nd	1st	**Fluid pressure and its measurements** Definitions and units of fluid pressure, pressure intensity and pressure head. Pascal's Law.
	2nd	Concepts of atmospheric, gauge, vacuum and absolute pressure.
	3rd	Pressure Measuring instruments: Manometers (simple, differential and piezometers),
	4th	Numerical
3rd	1st	Numerical
	2nd	Mechanical Gauges (Bourdon's tube pressure gauge)
	3rd	Review Class
	4th	Assignment / Class Test
4th	1st	**Hydrostatics**

		Definition of hydrostatic pressure, total pressure and centre of pressure.
	2nd	Total pressure and centre of pressure of immersed horizontal bodies
	3rd	Total pressure and centre of pressure of immersed vertical bodies
	4th	Numerical
5th	1st	Concept of flotation, buoyancy, centre of buoyancy, Archimedes principle
	2nd	Metacentre and metacentric height

	3rd	Numerical
	4th	Review Class
6th	1st	Assignment Evaluation / Class Test
	2nd	**Kinematics of Flow** Types of fluid flow
	3rd	Continuity equation (statement and proof), Numerical
	4th	Numerical
7th	1st	Assignment Evaluation / Class Test
	2nd	State and Prove Bernoulli's equation,
	3rd	Limitations of Bernoulli's theorm
	4th	Numerical
8th	1st	Practical applications of Bernoulli's equation: Venturi meter.
	2nd	Numerical
	3rd	Pitot tube
	4th	**Orifices, notches & weirs** Definition of Orifice, Types
9th	1st	Orifice co-efficient and relation among them.
	2nd	Definition of notch and weir, Classifications of notches & weirs
	3rd	Discharge over a rectangular notch or weir.
	4th	Discharge over a triangular notch or weir
10th	1st	Numerical
	2nd	Numerical
	3rd	Quizz test

	4th	Flow through pipe: Darcy-Weisbach formula, Numerical
11th	1st	Chezy's formula for loss of head due to friction in pipes. Numerical
	2nd	Assignment Evaluation / Class Test
	3rd	Pipe losses, Hydraulic Gradient, Total Energy Line.
	4th	Numerical
12th	1st	Review Class
	2nd	**Impact of jets** Force exerted by the Impact of jet on a stationary vertical plate
	3rd	Numerical
	4th	Force exerted by a jet on a moving Vertical flat plate,
13th	1st	Numerical
	2nd	Derivation of work done on series of vanes and condition for maximum efficiency.
	3rd	Numerical
	4th	Assignment Evaluation / Class Test
14th	1st	Impact of jet on moving curved vanes, illustration using velocity triangles, derivation of work done, efficiency.
	2nd	Numerical
	3rd	Review Class
	4th	Revision
15th	1st	Revision
	2nd	Revision
	3rd	Discussion of previous year questions
	4th	Discussion of previous year questions

Learning Resources

1. Text Book of Fluid Mechanics by R.K.Bansal

2. Text Book of Fluid Mechanics by R.S khurmi

3.Text Book of Fluid Mechanics by R.K.Rajput

4. Text Book of Fluid Mechanics Modi & Seth