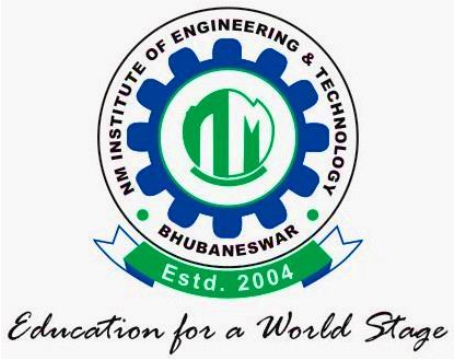
NM INSTITUTE OF ENGINEERING & TECHNOLOGY

BHUBANESWAR

Mechanical Engineering Department



LESSON PLAN

Session 2023-2024

Semester: 4TH

Subject: FLUID MECHANICS

Faculty Name: OMPRAKASH NARAYAN KAR

Subject: FM No of Days/per week class allotted: 4

Semester from date: to date: No. of Weeks: 15

Week	Class Day	Theory topics
1	1	Introduction to Properties of Fluid.
	2	Description of fluid properties like Density, Specific weight.
	3	Fluid properties - specific gravity, specific volume & related problems.
	4	Discussion of simple problems on fluid properties
2	1	Definitions and Units of Dynamic viscosity, Newton's Law of Viscosity.
	2	Definitions and Units of kinematic viscosity
	3	Description of surface tension and its unit Capillary phenomenon
	4	Surface tension and Capillary rise or fall phenomenon
3	1	Definitions and units of fluid pressure, pressure intensity and pressure head.
	2	Statement of Pascal's Law
	3	Concept of atmospheric pressure, gauge pressure, vacuum pressure and absolute pressure
	4	Vacuum pressure and absolute pressure
4	1	Fluid Pressure measuring instruments
	2	Simple Manometers and sample problem discussion.
	3	Differential Manometers and sample problem discussion.
	4	Bourdon tube pressure gauge, related figure, principle and Simple Numerical discussion
5	1	Solve simple problems on Manometers from previous year papers.
	2	Introduction to Hydrostatics law and pressure concept.
	3	Total pressure and centre of pressure on immersed bodies.
	4	Pressure on horizontal immersed bodies or surfaces.
6	1	Total pressure and centre of pressure on vertical bodies or surfaces.
	2	Solve problems related to Total pressure and centre of pressure.
	3	Archimedes 'principle, concept of buoyancy.
	4	Meta-center and Meta-centric height of floating bodies.
7	1	Concept of floatation.
	2	Condition of stability of floating and submerged bodies.
	3	Introduction to **Kinematics of Flow**
	4	Types of fluid flow

Signature of Faculty

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Week	Class Day	Theory topics
8	1	Continuity equation(Statement and proof for one dimensional flow).
	2	Bernoulli's theorem (Statement and proof).
	3	Applications and limitations of Bernoulli's theorem.
	4	Venturimeter .
9	1	pitot tube.
	2	Define orifice and Flow through orifice.
	3	Orifices coefficient & the relation between the orifice coefficients.
	4	Classifications of notches & weirs
10	1	Discharge over a rectangular notch or weir.
	2	Previous year questions discussion on rectangular notch or weir
	3	Discharge over a triangular notch or weir.
	4	Previous year questions discussion on triangular notch or weir.
11	1	Orifice meter
	2	Simple problems on above
	3	Q& A Discussion
	4	Introduction to Definition of pipe and Flow through pipe.
12	1	Loss of energy in pipes.
	2	Head loss due to friction.
	3	Expression of Darcy's formula.
	4	Expression of Chezy's formula.
13	1	Solve Problems using Darcy's formula.
	2	Solve Problems using Chezy's formula.
	3	HGL - Hydraulic gradient Line
	4	TGL - total gradient line
14	1	Solve simple problems from previous year question papers.
	2	Introduction to Impact of jets.
	3	Impact of jet on fixed flat plates
	4	Impact of jet on moving vertical flat plates.
15	1	Derivation of work done on series of vanes.
	2	Condition for maximum efficiency.
	3	Impact of jet on moving curved vanes
	4	Illustration using velocity triangles, derivation of work done, efficiency.

Signature of Faculty