VIKASH INSTITUTE OF TECHNOLOGY, BARGARH

LESSON PLAN

Semester: 4th		**Year: 2nd**	**Course: B.Tech**
Branch : ME		**Sub: Fluid Mechanics and Hydraulic Machine** **Sub Code : MEPC2003**	**Total Credit:03**
Name of the Faculty:		**Dr. Chinmay Deheri**	
Designation :		**Associate Professor**	
Department :		**Mechanical Engineering**	
Session		**2024-25**	
Recommended Books		**Text book**: **1. Fluid Mechanics, Y.A.Cengel,Publisher: TMH** **2. Fluid Mechanics and Hydraulic Machines, Modi and Sheth.** **Reference Books**: **1. Introduction to Fluid Mechanics and Fluid Machines, S.K.Som and G. Biswas, TMH.** **2. Fluid Mechanics and Fluid Machines, A. K. Jain, Khanna Publications.**	
Sl. No.	**Lecture No.**	**Topics to be covered**	**No. of Classes**
		MODULE-1	
1	Lecture-01	Introduction: Scope of fluid mechanics; Properties of fluids (density, specific gravity, specific weight, specific volume, surface tension and capillarity, viscosity, compressibility and bulk modulus); Fluid classification	**6**
2	Lecture-02	Fluid Statics: Pressure, Pascal's law	
3	Lecture-03	Pressure variation for incompressible fluid,Atmospheric pressure, Absolute pressure. Gauge pressure and vacuum pressure	
4	Lecture-04	Manometers, Hydrostatic forces on submerged surfaces	
5	Lecture-05	Force on a horizontal submerged plane surface, force on a vertical submerged plane surface, Buoyancy and flotation	
6	Lecture-06	Archimedes' principle, Stability of immersed and floating bodies, Determination of metacentric height	
		MODULE-2	
7	Lecture-07	Fluid Kinematics: Introduction, Description of fluid flow, Classification of fluid flow	**6**
8	Lecture-08	Reynolds number, Acceleration of fluid flow, Flow rate	
9	Lecture-09	Continuity equation, Differential equation of continuity	
10	Lecture-10	Mathematical description of irrotational and rotational flow,	
11	Lecture-11	Circulation, Potential function and stream function	
12	Lecture-12	Flow net	
		MODULE-3	
13	Lecture-13	Fluid Dynamics: Introduction to Navier Stokes equation, Non-dimensional numbers	**6**
14	Lecture-14	Euler's equation along a streamline, Energy equation	
15	Lecture-15	Bernoulli's equation and its application to venturimeter, Orificemeter, Pitot tube and siphon	
16	Lecture-16	Flow in pipes and ducts	
17	Lecture-17	Hydraulic gradient lines (HGL), Total energy line (TEL)	
18	Lecture-18	Power transmission in fluid flow through pipes, Fluid flow in pipes in series and parallel.	

MODULE-4			
19	Lecture-19	Impact of Jets: Flat, inclined and curved plates with stationary and moving cases	**6**
20	Lecture-20	Hydraulic Turbines: Classifications, Impulse and Rection turbines	
21	Lecture-21	Efficiency and performance curves	
22	Lecture-22	Reaction Turbines: Francis turbine and Kaplan turbine	
23	Lecture-23	velocity triangle and efficiencies, performance curve	
24	Lecture-24	Function of draft tube and casing cavitation	
MODULE-5			
25	Lecture-25	Centrifugal Pump: Constructional features	**6**
26	Lecture-26	Vane shapes, Velocity triangles, efficiencies	
27	Lecture-27	Multistaging, Pump characteristics, NPSH and Cavitation.	
28	Lecture-28	Positive Displacement Pumps	
29	Lecture-29	Reciprocating pumps, Working principles, Discharge	
30	Lecture-30	Work done and Power requirement, Slip, Indicator diagram.	

Signature of Faculty Member **Signature of HOD**

PRINCIPAL