

## LESSON PLAN

**Name of Faculty : Deepak Panwar**  
**Subject : Fluid Mechanics**

**Discipline : Civil Engineering**  
**Semester : 3rd**

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**Lesson plan Duration :15 weeks**

Week	Lecture Day	THEORY	Delivery Date of Lecture		Whether the Lesson Plan Followed ?
		TOPIC			
		(including Assignments / Seeminar / Group Discussion / Sessional Tests)	Expected	Actual	Yes / No
1st	1st	<b>UNIT I 1. Properties of Fluids</b> 1.1 Introduction: Fluid Mechanics, Hydrostatics, Hydrodynamics, Hydraulics			
	2nd	1.2 Density or Mass Density, Specific Weight or Weight Density, Specific Volume, Specific Gravity 1.3 Viscosity: Units of viscosity, Kinematic Viscosity, Newton's Law of viscosity, Variation of viscosity with temperature.			
2nd	3rd	1.4 Types of Fluids: Ideal, Real, Newtonian, Non-Newtonian and ideal Plastic fluids.			
	4th	1.5 Compressibility, Bulk Modulus, Surface Tension, Capillarity, Vapour Pressure and Cavitation			
3rd	5th	<b>2. Pressure and its Measurement</b> 2.1 Pascal's Law, Fluid pressure at a point and Pressure variation in a fluid at rest.			
	6th	2.2 Types of Pressure: Absolute Pressure, Gauge Pressure, Vacuum Pressure and Atmospheric Pressure			
4th	7th	2.3 Measurement of Pressure: Simple and Differential Manometer (with Numerical Problems)			
	8th	<b>UNIT II 3. Hydrostatic Force on Surfaces</b>			
5th	9th	<b>Assignment – 1 / Group discussion / Technical Quiz / Seminar</b>			
	10th	<b>Sessional Test - 1</b>			
6th	11th	3.1 Total Pressure and Centre of Pressure			
	12th	3.2 Vertical, Horizontal Plane surfaces (Rectangular and Trapezoidal) submerged in liquid (No derivation - Simple Numerical Problems)			
	13th	<b>4. Buoyancy and Floatation</b> 4.1 Buoyancy and Centre of Buoyancy			

7th	14th	4.2 Meta-centre and Meta-centric Height 4.3 Analytic Method for Meta-centric Height (Concept only – Simple Numerical Problems)			
8th	15th	Conditions of equilibrium of a floating and sub-merged bodies (Concept only)			
	16th	<b>UNIT III 5. Flow of Fluids</b>			
9th	17th	5.1 Types of Flow: Steady and Unsteady Flow, Uniform and Non-Uniform Flow, Laminar and Turbulent Flow, Compressible and Incompressible Flow			
	18th	5.2 Discharge and Continuity Equation (No derivation - Simple Numerical Problems) 5.3 Types of hydraulic energy: Potential energy, kinetic energy, pressure energy			
10th	19th	5.4 Bernoulli's Theorem: Statement and Description (without Proof of Theorem - Simple Numerical Problems)			
	20th	<b>6. Flow Measurements</b> 6.1 Venturimeter and Orificemeter (without Proof) 6.2 Pitot-tube and Current meter			
11th	21st	6.3 Orifices, Hydraulic Co-Efficient ( $C_v$ , $C_c$ and $C_d$ ) and their relationship 6.4 Discharge over a Rectangular and Trapezoidal Notch (No Derivation)			
	22nd	6.5 Discharge over a Rectangular and Trapezoidal Weir (No Derivation)			
12th	23rd	<b>Assignment – 2 / Group discussion / Technical Quiz / Seminar</b>			
	24th	<b>Sessional Test – 2</b>			
13th	25th	<b>UNIT IV 7. Flow Through Pipes</b> 7.1 Reynold's number, laminar and turbulent flow - explained through Reynold's experiment			
	26th	7.2 Loss of Energy in Pipes: Major and Minor Energy Losses (No derivation of formula) 7.3 Loss of Energy in Pipes: Simple Numerical Problems 7.4 Hydraulic gradient line and total energy line 7.5 Pipes in series and parallel: Simple Numerical Problems			

14th	27th	<b>8. Dimensional Homogeneity</b> 8.1 Secondary and Derived Quantities 8.2 Dimensional Homogeneity 8.3 Dimensional Numbers: Reynold's Number, Froude's Number, Euler's Number, Weber's Number, Mach's Number (Only concept)			
	28th	<b>UNIT V 9. Flow in Open Channel</b> 9.1 Definition and classification of flow in open channels 9.2 Discharge through open channel by Chezy's formula			
15th	29th	9.3 Most economical section of channels (No Derivation - Simple Numerical Problems) i) Rectangular Channel Section ii) Trapezoidal Channel Section <b>10. Hydraulic Pumps</b> Reciprocating Pump, Centrifugal Pump, Differences between Reciprocating Pump and Centrifugal Pump (No Derivations and Numerical)			
	30th	<b>Sessional Test-3</b>			