Subject: PC/CE/32-T Fluid Mechanics-I   Sem: 3rd

Week	Lecture Day	Topic (Including assignment / Test)	Date
		Theory	
1st	1.	**Basic Concepts and Definitions** – Distinction between a fluid and a solid	
	2.	Density, Specific weight, Specific gravity, specific volume	
	3.	Kinematic and dynamic viscosity, Variation of viscosity with temperature	
	4.	Numerical Examples	
2nd	5.	Newtonian and Non-Newtonian fluids, real and ideal fluids, Newton law of viscosity	
	6.	Cavitations, surface tension, capillarity,	
	7.	Bulk modulus of elasticity, compressibility	
	8.	Vapour pressure, boiling point	
3rd	9.	**Fluid Statics** - Fluid Pressure, Pressure at a point	
	10.	Pascal's law	
	11.	Pressure variation with temperature, gauge and absolute pressure	
	12.	Piezometer, U-Tube Manometer	
4th	13.	Single Column Manometer	
	14.	U Tube Differential Manometer	
	15.	Micro manometers, pressure gauges	
	16.	Numerical Examples	
5th	17.	Hydrostatic pressure and force: horizontal, vertical and inclined surfaces	
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	19.	Buoyancy and stability of floating bodies	
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6th	21.	Determination of metacentric height,	
	22.	fluid masses subjected to uniform acceleration, free and forced vortex.	
	23.	**Fluid Kinematics**-Classification of fluid flow	
	24.	Steady and unsteady flow; uniform and non-uniform flow, Laminar and turbulent flow; rotational and irrotational flow	
7th	25.		
	26.		
	27.	Minor Test 1	
	28.		
8th	29.	Compressible and incompressible flow, One, two and three dimensional flows	
	30.	Stream line, path line, streak line and stream tube	
	31.	Stream function,	
	32.	velocity potential function	
9th	33.	One, two and three dimensional continuity equations in Cartesian coordinates	
	34.	**Fluid Dynamics**- Surface and body forces	
	35.	Equations of motion - Euler's equation	
	36.	Numerical Examples	
10th	37.	Bernoulli's equation – derivation; Energy Principle	
	38.	Practical applications of Bernoulli's equation	
	39.	Venturimeter, orifice meter and Pitot tube;	
	40.	Momentum principle	
11th	41.	Sharp crested weirs and notches,	
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	43.	Important dimensionless numbers and their significance	
	44.	Buckingham's π-Theorem.	
12th	45.	Geometric, kinematic and dynamic similarity, model studies, physical modeling, similar and distorted models.	
	46.	**Laminar Flow:** Navier Stoke's equation	
	47.	Laminar flow between parallel plates, Couette flow	
	48.	laminar flow through pipes-Hagen Poiseuille law.	
13th	49.	Laminar flow between parallel plates,	
	50.	laminar flow around a sphere-Stokes' Law	
	51.	Drag and Lift	
	52.	Numerical Examples	
14th	53.		
	54.		
	55.	Minor Test 2	
	56.		
15th	57.	Types of drag on a sphere, flat plate, cylinder and airfoil	
	58.	Development of lift on immersed bodies like circular cylinder and airfoil.	
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	60.	Numerical Examples	