ATME College of Engineering

Department of Mechanical Engineering

Lesson Plan & Work-Done Diary for AY:2024-25, Even Semester

Course with Code: Fluid Mechanics BME403				Faculty: Dr. Srinivasa. K				Semester & Section: 4th Sem
MODULE-1								
Class No.	**Date Planned (DD/MM)**	**Topics to be covered**	**TLP Planned**	**Class No.**	**Date of Conduction (DD/MM)**	**Topics Covered**	**TLP Executed**	**Remarks if any deviation**
1		Introduction, Properties of fluids-mass density, weight density, specific volume, specific gravity,	Chalk & Talk PPT	1				
2		Numerical on mass density, weight density, specific volume, specific gravity,	Chalk & Talk PPT	2				
3		Viscosity, surface tension,	Chalk & Talk PPT	3				
4		Capillarity, vapour pressure,	Chalk & Talk PPT	4				
5		Compressibility and bulk modulus. Concept of continuum, types of fluids	Chalk & Talk PPT	5				
6		Pressure at a point in the static mass of fluid, variation of pressure	Chalk & Talk PPT	6				
					27/02/25			

7		Pascal's law, Absolute, gauge, atmospheric and vacuum pressures pressure measurement by simple, differential manometers and mechanical gauges.	Chalk	7				
8		Numerical on Pascal's Law.	Chalk	8				
9		Numerical on Monometers	Chalk	9				
10		Fluid Statics: Total pressure and centre of pressure for horizontal plane, vertical plane surface and inclined plane surface submerged in static fluid.	Chalk & Talk PPT	10				
MODULE-2								
Class No.	**Date planned. (DD/MM)**	**Topics to be covered**	**TLP Planned**	**Class No.**	**Date of Conduction (DD/MM)**	**Topics Covered**	**TLP Executed**	**Remarks if any deviation**
11		Fluid Kinematics: Types of Flow-steady, unsteady, uniform, non-uniform, laminar, turbulent, one, two and three dimensional, compressible, incompressible, rotational, irrotational,	Chalk & Talk PPT	11				
12		Streamlines, path lines, streak lines,	Chalk & Talk PPT	12				
13		Velocity components, convective and local acceleration, velocity potential	Chalk & Talk PPT	13				
14		Continuity equation in Cartesian co-ordinates	Chalk	14				
15		Rotation, vorticity and circulation	Chalk	15				

16		Laplace equation in velocity potential and Poisson equation in stream function, flow net,	Chalk & Talk PPT	16				
17		Numerical on Continuity equation	Chalk	17				
18		Numerical on Poisson equation	Chalk	18				
19		Laminar and Turbulent flow: Flow through circular pipe, between parallel plates,	Chalk & Talk PPT	19				
20		Power absorbed in viscous flow in bearings, Poiseuille equation. **QUIZ-1**	Chalk	20				
MODULE-3								
Class No.	**Date planned. (DD/MM)**	**Topics to be covered**	**TLP Planned**	**Class No.**	**Date of Conduction (DD/MM)**	**Topics Covered**	**TLP Executed**	**Remarks if any deviation**
21		Fluid Dynamics: Momentum equation, impacts of jets- force on fixed and moving vanes, flat and curved.	Chalk & Talk PPT	21				
22		Numerical on impacts of jets	Chalk	22				
23		Euler's equation, Integration of Euler's equation to obtain Bernoulli's equation,	PPT	23				
24		Application of Bernoulli's theorem such as venture meter.	Chalk	24				
25		Orifice meter, rectangular and triangular notch, pitot tube, orifices etc	Chalk	25				

26		Numerical on Venturi meter	Chalk	26				
27		Numerical on Orifice meter and notches.	Chalk	27				
28		Numerical on Pitot tubes and orifices.	Chalk	28				
29		Effect of change in cross section and application of the Bernoulli equation	Chalk & Talk PPT	29				
30		Working principle of different flow meters for open channel and their calibration	Chalk & Talk PPT	30				
MODULE-4								
Class No.	**Date planned. (DD/MM)**	**Topics to be covered**	**TLP Planned**	**Class No.**	**Date of Conduction (DD/MM)**	**Topics Covered**	**TLP Executed**	**Remarks if any deviation**
31		Flow over bodies: Development of boundary layer,	Chalk & Talk PPT	31				
32		Lift and Drag, Flow around circular cylinders, sphere	Chalk & Talk PPT	32				
33		Aerofoils and flat plates	Chalk & Talk PPT	33				
34		Streamlined and bluff bodies, boundary layer separation and its control	Chalk & Talk PPT	34				
35		Dimensional Analysis: Derived quantities, dimensions of physical quantities,	Chalk & Talk	35				
36		Dimensional homogeneity, Rayleigh method	Chalk & Talk	36				

37		Buckingham Pi-theorem	Chalk	37				
38		Dimensionless numbers, similitude, types of similitude.	Chalk & Talk PPT	38				
39		Measurement of pressure using different Manometers for high- and low-pressure measurements	Chalk & Talk PPT	39				
40		Impact of jet on flat and curved plates	Chalk & Talk	40				
MODULE-5								
Class No.	**Date planned. (DD/MM)**	**Topics to be covered**	**TLP Planned**	**Class No.**	**Date of Conduction (DD/MM)**	**Topics Covered**	**TLP Executed**	**Remarks if any deviation**
41		Introduction to CFD: Necessity	PPT	41				
42		limitations, philosophy behind CFD, Applications CFD	PPT	42				
43		Compressible flows: Speed of sound, adiabatic and isentropic steady flow, **QUIZ-2**	PPT	43				
44		Isentropic flow with area changes stagnation and sonic properties, normal and oblique shocks, flow through nozzles.	PPT	44				
45		Working principle of different flow meters for open channel and their calibration	Chalk & Talk	45				
46		Measurement of coefficient of pressure distribution on a cylinder at different Reynolds Numbers	Chalk & Talk	46 47				

47		Determine the viscosity of oil using red wood viscometer and Say-bolt viscometer.	Chalk & Talk					
48		Reynolds apparatus to measure critical Reynolds number for pipe flow	Chalk & Talk	48				
49		Working principle of different flow meters and their calibration (orifice plate, venture meter, turbine, Rota meter, electromagnetic flow meter	Chalk & Talk	49				
50		Lab IA	Chalk & Talk	50				

	Activity	Planned	Actual	Remarks
1	Theory Classes	50		
2	Demonstrations & Lab Visit/ Experiment conduction	-		
3	Assignments/ Quizzes/ reports	2+3		
4	Tutorials/ Extra classes	-		
5	Internal Assessments	3		
6	ICT based Teaching. (% of usage in Curriculum)	40%		
Planning			**Execution**	
Faculty Signature:			**Faculty Signature:**	
HoD Signature:			**HoD Signature:**	