

K L UNIVERSITY
FLUID MECHANICS (CE C 202)

SYLLABUS

L	T	P	Cr
3	1	2	5

UNIT – 1 Fluid Properties

Definition of fluid, properties of fluid-density, specific weight, specific gravity, viscosity, classification of fluids, surface tension and capillarity, vapour pressure and cavitation.

Fluid Statics: Introduction, pressure, Pascal's law, hydrostatic law, measurement of pressure-simple and differential manometers, Total pressure and centre of pressure on vertical, horizontal, Inclined and curved surfaces.

UNIT – 2 Fluid Statics-Buoyancy and Floatation

Buoyancy, centre of buoyancy, Meta-centre, Meta-centric height

Fluid Kinematics: Introduction, types of fluid flow, Discharge, Continuity equation, Continuity equation in three dimensional flow, velocity potential function and stream function, vortex flow

UNIT – 3 Fluid Dynamics

Introduction, Euler's equation of motion, Bernoulli's equation and applications, Venturimeter, Orificemeter, Pitot-tube, coefficient of discharge, Introduction to orifices and mouth pieces.

Momentum Equation: Impulse-momentum equation, Force exerted by flowing fluid on pipe-bend.

UNIT – 4 Flow Through Pipes

Introduction, major and minor energy losses, hagen-poiseuille law, Hydraulic gradient and total energy line, pipes in series and parallel, Transmission of power through pipe, Water hammer.

UNIT – 5 Boundary Layer Theory

Introduction, laminar, turbulent boundary layer, boundary layer thickness, displacement thickness, momentum thickness, energy thickness, separation of boundary layer, Methods of preventing separation

Dimensional Analysis & Model Similitude: Introduction, Buckingham's PI theorem, Model analysis, Types of similarities, Dimensionless numbers, Classification of models, Model laws-Reynolds and Froude model law

TEXT BOOKS:

1. Fluid mechanics by SK Som G Biswas, Tata McGraw-Hill Publications.
2. Fluid mechanics by John F.Douglas, Pearson Publications.

REFERENCE BOOKS:

1. Fluid Mechanics by Frank M white
2. Fluid Mechanics by A.cengel and John M.Cimbala
3. Fluid Mechnics by G.S sawhney
4. Fluid Mechanics by Edward J.Shaughnessy

CE/BOS/CE C202/0210

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LIST OF EXPERIMENTS

1. Determination of coefficient of discharge of rectangular notch
2. Determination of coefficient of discharge of V - notch
3. Determination of coefficient of discharge of orifice
4. Determination of coefficient of discharge of mouth piece
5. Determination of coefficient of discharge of orifice meter
6. Determination of coefficient of discharge of venturimeter
7. Determination of Darcy friction factor due to friction in a pipe flow
8. Determination of minor losses due to sudden expansion and contraction in a pipe flow
9. Verification of Bernoulli's theorem
10. Fluid flow analogy using Reynolds apparatus