16/06/17
Friday

[15MT/PC/FD 34]

Fluid Dynamics

Unit - 1

CA

The kinematics of Fluids in Motion

1.1 Real Fluids and Ideal Fluids - Velocity of a Fluid at a Point

1.2 Stream Lines and Path Lines - Velocity Potential - Vorticity (2m)

7:30 - 10.00

1.3 Local and Particle Rates of Change

1.4 Equation of Continuity

1.5 Acceleration of a Fluid - Conditions at a Rigid Boundary.

Unit - 2

CA

Equations of Motion of a Fluid

2.1 Pressure at a Point in a Fluid at Rest

2.2 Pressure at a Point in a Moving Fluid - Conditions at a Boundary of Two Inviscid Immiscible Fluids

10.00 - 1.00

2.3 Euler's Equation of Motion - Bernoulli's Equation

2.4 Steady Motion under Conservative Body Forces

2.5 Kelvin's Circulation Theorem

Unit - 3

After lunch

CA

Some Two & Three - Dimensional Flows

3.1 Some flows involving Axial Symmetry - Irrotational Stationary Sphere in a

26th

Uniform Stream - Sphere moving with Constant velocity in Liquid which is otherwise at Rest.

3.2 Sources, Sinks and Doublets

3.3 Axi Symmetric Flows - Stoke's Stream fn Spe Forms of the stream fn for Axi-symmetric Irrotational Motions.

3.4 Meaning of Two-Dimensional force flows

Unit - 4

10/11/17 After Sleep

Complex Velocity Potential

4.1 Complex Velocity Potential for standard

4.2 Two Dimensional Flows

4.2 Milni - Thomson Circle theorem - Extension of the Circle Theorem

4.3 Theorems of Blasius

before tea

Unit - 5

Viscous Flow

5.1 Stress Components in a Real Fluid - Coefficient of Viscosity and Lamin Flow

5.2 Navier - Stokes Equation of Motion of a Viscous Fluid

5.3 Some Solvable Problems in Viscous Flow

5.4 Steady Viscous Flow in Tubes of Uniform Cross-section

5:00-7:00

Text Book:

Chorlton. F. "Text book of Fluid Dynamics. 1st ed. New Delhi: Shadara, 1985.

Chapter	Sections
2	2.1 – 2.10
3	3.1 – 3.7, 3.12, 3.9
4	4.1, 4.2, 4.5
5	5.1, 5.4 – 5.6, 5.8, 5.9
8	8.8 – 8.11

After dinner Problems

Books for Reference:

1. Duncan W. J., Thom. A. S. and Young A. D., Mechanics of Fluid. Great Britain: The English Language book society, 1975.
2. Joseph H. Spurk, Fluid Mechanics: Problems and Solutions. Springer-Verlag, 2003.
3. Thomson Milne L. M., Theoretical Hydro Dynamics. (IV Edition), New York.: Macmillan and Co., 1960