Year & Sem: E1S2	Course Code: CE1202	Course Name: **Fluid Mechanics**	No. of Credits: 4	L	T&PS	P
				2	2	0

UNIT-I: Fundamental Concepts of Fluid Flow:
Fundamental definitions, Flow characteristics, Classification of fluids, Fluid properties, Foundations of flow analysis.
Fluid Statics: Fluid pressure, Forces on solid surfaces, Buoyant forces.

UNIT-II: **Kinematics of Fluid Flow:**
Equations for acceleration, Continuity equation, Irrotational and rotational flow, Potential and stream functions.

UNIT-III: **Dynamics of Fluid Flow:**
Finite control volume analysis, Euler and Bernoulli's theorems, Impulse momentum theory, Applications of energy and momentum equations

UNIT-IV: **Laminar and Turbulent Flows:**
Types of flow, Reynolds experiment, Laminar flow between parallel plates, Laminar flow in pipes, Turbulent flow in pipes.

UNIT-V: **Pipe Flow Systems:**
Darcy-Weisbach equation, Moody diagram, Energy losses in pipelines, Minor losses, Multiple pipe systems.
Dimensional Analysis: Model similitude, Model scales, Theory and applications.

UNIT-VI: **Navier- Stokes Equations and Applications:**
Introduction to Navier- Stokes equations, exact solutions for simple cases of flow, Plane Poiseuille flow, Coutte flow, Stokes flow and porous media flow.
Boundary Layer Theory and Applications: Concepts of boundary layer, Flow separation, Circulation, Drag and lift on immersed bodies.

References/Text Books:
1. Douglas, J.F. ,Gasiorek, J.M. ,Swaffield, J.A., Fluid Mechanics , Addison-Wesley, Harlow 1999.
2. Streeter, V.L. Wylie, E. Benjamin, Fluid Mechanics, McGraw-Hill, London, 1998.
3. Shames, I.H., Mechanics of Fluids, McGraw Hill, New York, 1992.
4. Jain, A.K., Fluid Mechanics, Khanna Publishers, New Delhi, 1998.
5. Modi, L.P.N, Seth, S.M., Hydraulics and Fluid Mechanics, Standard Book House, New Delhi, 2002.

Lecture Plan: Unit-I & -II syllabus for MID-I, Unit-III & -IV syllabus for MID-II and Unit-V & -VI syllabus for MID-III examinations.

Video Lectures (Web Links):
1. http://nptel.ac.in/courses/105101082/