PCI3I101- FLUID MECHANICS & HYDRAULICS MACHINES
LESSON PLAN

Semester- 3rd

Branch/Course- Civil Engineering

Lecture No	Module	Topics to be delivered
01	I	Physical property of Fluid
02	I	Density, specific gravity, specific weight, specific volume, surface tension and capillarity, viscosity, compressibility and bulk modulus
03	I	Fluid classification
04	I	Pressure, pascal's law
05	I	Pressure variation for incompressible fluid &manometer
06	I	Hydrostatic pressure on submerged surface, force on a horizontal submerged plane surface
07	I	Force on a vertical submerged plane surface
08	I	Buoyancy and floatation
09	I	Archimedes' principle, stability of immersed and floating bodies
10	I	Determination of metacentric height
11	II	Fluid kinematics
12	II	Reynold's number, Acceleration of fluid particles
13	II	Flow rate and continuity equation
14	II	Differential equation of continuity
15	II	Mathematical definitions of irrotational and rotational motion
16	II	Circulation, potential function and stream function. Flow net
17	III	Fluid dynamics
18	III	Euler's equation along a streamline
19	III	Bernoulli's equation and its application to siphon
20	III	Venturimeter, orificemeter, pitot tube.Flow in pipes and ducts
21	III	Loss due to friction, Minor energy losses in pipes
22	III	Hydraulic gradient line (hgl), total energy line (tel)
23	III	Power transmission in the fluid flow in pipes
24	III	Fluid flow in pipes in series and parallel.
25	IV	Hydraulic turbine: Classification, Impulse and Reaction turbine
26	IV	Impulse turbine, Pelton wheel
27	IV	Reaction Turbines: Francis turbine and Kaplan turbine
28	IV	Velocity triangle and efficiencies, performance curve.
29	IV	Function of draft tube and casing cavitation
30	IV	Centrifugal pump & pump characteristic
31	IV	NPSH and Cavitation, Reciprocating Pump, Working principle, Discharge

Course Outcome

Course Outcome	Descriptions (Students will be able to)
CO1	Understand the basic properties of fluids and apply Newton's Law of Viscosity in solving practical problems.
CO2	Understand the significance of basic principles of fluid statics and application of hydrostatic law in determining forces on surfaces and hydraulic structures, floatation and stability of floating bodies like boats, ships, naval vessels etc.
CO3	Understand the principles of kinematics with specific emphasis on application of continuity equation, stream function etc.
CO4	Apply the principles of Bernoulli's equation in measurement of discharge in pipes, and in other pipe flow problems.
CO5	Computation of friction loss in laminar and turbulent flows.
CO6	Understand the working principle of pumps and turbines.