DEPARTMENT OF CIVIL ENGINEERING RAJASTHAN TECHNICAL UNIVERSITY KOTA		
LECTURER PLAN SUBJECT - FLUID MECHANICS COURSE NAME & NO. – B.TECH III SEM SESSION - 2015-16		
UNIT	CONTENTS	CONTACT HOURS
I	**Introduction to objective, scope and outcome of the subject**	1
	Fluids: Definition, Ideal fluids, real fluids.	1
	Newtonian and non-Newtonian fluids	1
	Properties of Fluids: Units of measurement, Mass density.	1
	Specific weight,Specific volume, Specific Gravity.	1
	Viscosity, Surface tension and Capillarity.	1
	Compressibility and Elasticity.	1
II	**Hydrostatics :** Pressure at a point in a static fluid.	1
	Pressure variation in an incompressible static fluid; atmospheric pressure.	1
	Gauge pressure, vacuum pressure, absolute pressure.	1
	Manometers Bourdon pressure gauge.	1
	Buoyancy: Forces acting on immersed plane surface	1
	Centre of pressure, forces on curved surfaces.	1
	Conditions of equilibrium for floating bodies.	1
	Meta-centre and meta centric height experimental and analytical determination of meta centric height.	1
	. **Equilibrium of Fluid particles and flow**:	1
	Fluid mass subjected to horizontal and vertical acceleration and uniform rotation.	1
	Hydro-kinematics : Types of Flows	1

III	Steady and unsteady, uniform and nonuniform.	1
	Stream lines, path lines, stream tubes	1
	principles of conservation of mass.	1
	Equation of continuity, acceleration of fluid particles local and connective.	1
	Rotational and irrotational motions, free and forced vortex.	1
IV	Circulation and voracity velocity potential and stream function, elementary treatment of flow net.	1
	Euler's equations of motion and integration of Euler's equations	1
	Bernoulli's equation for incompressible Fluids	1
	assumptions in Bernoulli's equation,energy correction factor.	1
IV	**Momentum Equation and its Application**	1
	Development of momentum equation by control volume concept, Momentum correction factor.	1
	Applications– Borda's mouth pieces	1
	sudden enlargement of flow, pressure on flat plates,nozzles.	1
V	**Flow Through Pipes:** Laminar flow, Reynolds experiment	1
	transition from laminar to turbulent flow.Turbulent Flow	1
	Laws of fluid friction, friction factor Moodys diagram	1
	loss of head due to friction and other causes. Hydraulic gradient, total energy line	1
	Chezy's, Darcy's and Manning's formula. Flow through parallel pipes and pipes in series	2
	flow through branched pipes. Flow along a bypass.	1
	Power transmission through pipe, condition for maximum power. Elementary water hammer concept.	1
TOTAL		40