

LESSON PLAN

Discipline: Civil Engineering			Name of The Teaching Faculty: BIJAYA KUMAR ROUT			
Subject:TH:1- HYDRAULICS & IRRIGATION ENGINEERING			Semester From Date:22.12.2025 To Date 18.04.2026			
SEMESTER-4th (SUMMER 2026)			No. Of Weeks:19		3P/WEEK	
No. of Days/week class allotted: 03 period per week (Mon-1,Wed-1,Thus-1)					TOTAL PERIOD-45	
MONTH	WEEK	DATE	DAYS/PERIOD	SYLLABUS TO BE COVERED	NOS. OF PERIODS AVAILABLE	
DEC	4th			Pressure measurement and Hydrostatic pressure	2	
		22-12-2025	Mon	Technical terms used in Hydraulics –fluid, fluid mechanics, hydraulics, hydrostatics and hydrodynamics - ideal and real fluid, application of hydraulics. Physical properties of fluid – density-specific volume, specific gravity, surface tension, capillarity, viscosity-Newton’s law of viscosity. Various types of pressure – Atmospheric Pressure, Gauge Pressure, Absolute Pressure, Vacuum Pressure. Concept of Pressure head and its unit, Pascal’s law of fluid pressure and its uses.	1	
		24-12-2025	Wed	Measurement of differential Pressure by different methods. Variation of pressure with depth, Pressure diagram, hydrostatic pressure and center of pressure on immersed surfaces and on tank walls. Determination of total pressure and center of pressure on sides and bottom of water tanks, sides and bottom of tanks containing two liquids, vertical surface in contact with liquid on either side	1	
	5th				Fluid Flow Parameters	2
		29-12-2025	Mon	1.Types of flow – Gravity and pressure flow, Laminar, Turbulent, Uniform, Non-uniform, Steady, Unsteady flow. Reynolds number. 2. Discharge and its unit, continuity equation of flow.	1	
		31-12-2025	Wed	3.Energy of flowing liquid: potential, kinetic and pressure energy. 4. Bernoulli’s theorem : statement, assumptions, equation.	1	
JAN			Sat	Flow through pipes	8	
	1st	01-01-2026	Thu	Major head loss in pipe: Frictional loss and its computation by Darcy’s Weisbach equation	1	
	2nd	05-01-2026	Mon	Minor losses in pipe: loss at entrance, exit, sudden contraction, sudden enlargement and fittings.	1	
		07-01-2026	Wed	Flow through pipes in series, pipes in parallel and Dupuit’s equation for equivalent pipe.	1	
		08-01-2026	Thu	Hydraulic gradient line and total energy line.	1	
	3rd	12-01-2026	Mon	Discharge measuring device for pipe flow: Venturi meter - construction and working.	1	
		15-01-2026	Thu	Discharge measuring device for pipe flow: Venturi meter - construction and working.	1	
	4th	19-01-2026	Mon	Discharge measurement-using Orifice, Hydraulic Coefficients of Orifice.	1	
		21-01-2026	Wed	Discharge measurement-using Orifice, Hydraulic Coefficients of Orifice.	1	
					Flow through Open Channel	7
	5th	22-01-2026	Thu	Geometrical properties of channel section: Wetted area, wetted perimeter, hydraulic radius for rectangular and trapezoidal channel section.	1	
		28-01-2026	Wed	Geometrical properties of channel section: Wetted area, wetted perimeter, hydraulic radius for rectangular and trapezoidal channel section.	1	
29-01-2026		Thu	Determination of discharge by Chezy’s equation and Manning’s equation.	1		

FEB	1st	02-02-2026	Mon	Conditions for most economical rectangular and trapezoidal channel section.	1
		04-02-2026	Wed	Discharge measuring devices: Triangular and rectangular Notches.	1
		05-02-2026	Thu	Velocity measurement devices: current meter, floats and Pitot's tube.	1
	2nd	09-02-2026	Mon	Specific energy diagram, Froudes' Number	1
				Hydraulic Pumps	5
		11-02-2026	Wed	Concept of pump, Types of pump - centrifugal, reciprocating, submersible. Centrifugal pump: components and working	1
	3rd	12-02-2026	Thu	Reciprocating pump: single acting and double acting, components and working.	1
		16-02-2026	Mon	Suction head, delivery head, static head, Manometric head	1
		18-02-2026	Wed	Power of centrifugal pump.	1
	4th	19-02-2026	Thu	Selection and choice of pump.	1
				Introduction to Hydrology	5
		23-02-2026	Mon	Hydrology: Definition and Hydrological cycle	1
		25-02-2026	Wed	Rain Gauge: Symons rain gauge, automatic rain gauge,	1
MAR	1st	26-02-2026	Thu	Methods of calculating average rainfall: Arithmetic mean, Isohyetal, and Thiessen polygon method.	1
		02-03-2026	Mon	Runoff, Factors affecting Run off, Computation of run-off.	1
	2nd	05-03-2026	Thu	Maximum Flood Discharge measurement: Rational and empirical methods, Simple numerical problems. Yield and Dependable yield of a catchment, determination of dependable yield.	1
				Crop water requirement and Reservoir Planning	5
		09-03-2026	Mon	Irrigation and its classification.	1
		11-03-2026	Wed	Crop Water requirement: Cropping seasons, Crop period, base period, Duty, Delta, CCA, GCA, intensity of irrigation, factors affecting duty, Problems on water requirement and capacity of canal.	1
	3rd	12-03-2026	Thu	Methods of application of irrigation water and its assessment. Area capacity curve.	1
		16-03-2026	Mon	Silting of reservoir, Rate of silting, factors affecting silting and control measures.	1
		18-03-2026		Control levels in reservoir, Simple numerical problems on Fixing Control levels.	1
			Sat	Dams and Spillways	5
	4th	19-03-2026	Thu	Dams and its classification: Earthen dams and Gravity dams (masonry and concrete).	1
		23-03-2026	Mon	Earthen Dams – Components with function, typical cross section, seepage through embankment and foundation and its control.	1
		25-03-2026	Wed	Methods of construction of earthen dam, types of failure of earthen dam and preventive measures.	1
5th	26-03-2026	Thu	Gravity Dams – Forces acting on dam, Theoretical and practical profile, typical cross section, drainage gallery, joints in gravity dam, concept of high dam and low dam.	1	
	30-03-2026	Mon	Spillways-Definition, function, location, types and components, Energy dissipaters.	1	
1st			Diversion Head Works & Canals	6	
	02-04-2026	Thu	Weirs – components, parts, types, K.T. weir – components and construction	1	
	06-04-2026	Mon	Diversion head works – Layout, components and their function.	1	
	08-04-2026	Wed	Barrages – components and their functions. Difference between weir and Barrage.	1	

APR	2nd	09-04-2026	Thu	Canals – Classification according to alignment and position in the canal network, Cross section of canal in embankment and cutting, partial embankment and cutting, balancing depth, Canal lining - Purpose, material used and its properties, advantages.	1
	3rd	13-04-2026	Mon	Cross Drainage works- Aqueduct, siphon aqueduct, super passage, level crossing.	1
		15-04-2026	Wed	Canal regulators- Head regulator, Cross regulator, Escape, Falls and Outlets	1
		16-04-2026	Thu	RIVISION CLASS	1