

## GOVT. POLYTECHNIC MAYURBHANJ LESSON PLAN- 2025/26 (SUMMER)

Discipline : CIVIL ENGG.		Semester: 4th Sem		Name of the Teaching Faculty : Padmabhusan Naik	
Subject : H&IE		No. of Days / per week class allotted : 03		Semester From date : 22.12.2025 To Date : 18.04.2026	
MONTH	Week	Day	Unit	Topics	
DECEMBER 2025	4th	1st	UNIT-1	<b>Pressure measurement and Hydrostatic pressure</b>	
		2nd		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.	
		4th		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. Measurement of differential Pressure by different methods.	
	5th	1st		<b>X-Max Day</b>	
		2nd		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	
		2nd		<b>Fluid Flow Parameters</b>	
JANUARY 2026	1st	4th	UNIT-2	Types of flow – Gravity and pressure flow, Laminar, Turbulent, Uniform, Non-uniform, Steady, Unsteady flow. Reynolds number. Discharge and its unit, continuity equation of flow.	
		1st		Energy of flowing liquid: potential, kinetic and pressure energy. Bernoulli’s theorem : statement, assumptions, equation.	
	2nd	2nd	Question Discussion		
		4th	<b>CLASS TEST-1</b>		
		4th	<b>Flow through pipes</b>		
	3rd	1st	UNIT-3	Major head loss in pipe: Frictional loss and its computation by Darcy’s Weisbach equation,	
		2nd		Minor losses in pipe: loss at entrance, exit, sudden contraction, sudden enlargement and fittings.	
		4th		Flow through pipes in series, pipes in parallel and Dupuit’s equation for equivalent pipe.	
		4th		Hydraulic gradient line and total energy line.	
	4th	1st	Discharge measuring device for pipe flow: Venturi meter - construction and working.		
		2nd	Discharge measurement-using Orifice, Hydraulic Coefficients of Orifice.		
		4th	Question Discussion		
5th	1st	<b>Republic Day</b>			
	2nd	<b>Flow through Open Channel</b>			
	4th	Geometrical properties of channel section: Wetted area, wetted perimeter, hydraulic radius for rectangular and Determination of discharge by Chezy’s equation and Manning’s equation.			

FEBRUARY 2026	1st	1st	UNIT-4	Conditions for most economical rectangular and trapezoidal channel section.
		2nd		Discharge measuring devices: Triangular and rectangular Notches.
		4th		Velocity measurement devices: current meter, floats and Pitot's tube.
	2nd	1st	UNIT-5	Specific energy diagram, Froudes' Number
		2nd		Question Discussion
		4th		<b>Hydraulic Pumps</b>
	3rd	1st	UNIT-5	Concept of pump, Types of pump - centrifugal, reciprocating, submersible.
		2nd		Centrifugal pump: components and working
		4th		Reciprocating pump: single acting and double acting, components and working.
	4th	1st	UNIT-5	<b>INTERNAL ASSESSMENT-1</b>
		2nd		Suction head, delivery head, static head, Manometric head
		4th		Power of centrifugal pump.
4th		Selection and choice of pump.		
4th				
4th				
MARCH 2026	1st	1st	UNIT-6	<b>Introduction to Hydrology</b>
		2nd		Hydrology: Definition and Hydrological cycle, Rain Gauge: Symons rain gauge, automatic rain gauge,
		4th		<b>Dola Purnima</b>
	2nd	1st	UNIT-6	Methods of calculating average rainfall: Arithmetic mean, Isohyetal, and Thiessen polygon method.
		2nd		Runoff, Factors affecting Run off, Computation of run-off.
		4th		Maximum Flood Discharge measurement: Rational and empirical methods, Simple numerical problems.
	3rd	1st	UNIT-7	Yield and Dependable yield of a catchment, determination of dependable yield.
		2nd		<b>Crop water requirement and Reservoir Planning</b>
		4th		Irrigation and its classification.
	4th	1st	UNIT-7	Crop Water requirement: Cropping seasons, Crop period, base period, Duty, Delta, CCA, GCA, intensity of irrigation,
		2nd		Methods of application of irrigation water and its assessment. Area capacity curve.
		4th		Silting of reservoir, Rate of silting, factors affecting silting and control measures.
	5th	1st	UNIT-8	Control levels in reservoir, Simple numerical problems on Fixing Control levels.
		2nd		<b>INTERNAL ASSESSMENT-2</b>
		4th		<b>Dams and Spillways</b>
1st	1st	UNIT-8	Dams and its classification: Earthen dams and Gravity dams (masonry and concrete)	
	2nd		Earthen Dams – Components with function, typical cross section, seepage through embankment and foundation and its control	
	4th		Methods of construction of earthen dam, types of failure of earthen dam and preventive measures.	
	1st	UNIT-8	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.	
	2nd		Spillways-Definition, function, location, types and components, Energy dissipaters.	

APRIL 2026	2nd	4th	UNIT-9	<b>Diversion Head Works &amp; Canals</b>
				Weirs – components, parts, types, K.T. weir – components and construction, Diversion head works – Layout, components and their function. Barrages – components and their functions. Difference between weir and Barrage.
	3rd	1st		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.
		2nd		<b>Dr. B.R. Ambedkar Jayanti</b>
		4th		Cross Drainage works- Aqueduct, siphon aqueduct, super passage, level crossing. Canal regulators- Head regulator, Cross regulator, Escape, Falls and Outlets
				<b>CLASS TEST-2</b>

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20.12.2025