



GANAPATI INSTITUTE OF ENGINEERING AND TECHNOLOGY(POLY), JAGATPUR, CUTTACK

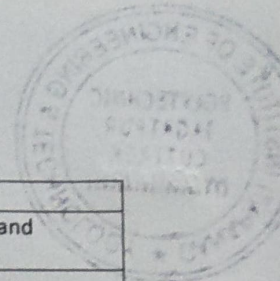
LESSON PLAN OF 4TH SEMESTER(2025-26) CIVIL ENGINEERING

DISCIPLINE- CIVIL ENGG.	SEMESTER-4 TH	NAME OF THE TEACHING FACULTY- JAYALAXMI BEHERA (LECTURER)
OBJECT- H&IE(Th.1)	NO. OF DAYS PER WEEK CLASS ALLOTTED-04	SEMESTER FROM DATE-22/12/25 TO DATE-18/04/26
WEEK	CLASS DAY	NO. OF WEEKS-17 THEORY TOPICS
1 ST	1 st	Pressure measurement and Hydrostatic pressure Technical terms used in Hydraulics –fluid, fluid mechanics, hydraulics, hydrostatics.
	2 nd	Hydrodynamics - Ideal and real fluid, application of hydraulics
	3 rd	Physical properties of fluid density-specific volum
	4 th	specific gravity, surface tension, capillarity, viscosity-Newton's law of viscosity.
2 ND	1 st	Various types of pressure – Atmospheric Pressure, Gauge Pressure, Absolute Pressure, Vacuum Pressure.
	2 nd	Concept of Pressure head and its unit, Pascal's law of fluid pressure and its uses.
	3 rd	Measurement of differential Pressure by different methods.
	4 th	Variation of pressure with depth, Pressure diagram, hydrostatic pressure and center of pressure on immersed surfaces and on tank walls.
3 RD	1 st	Determination of total pressure and center of pressure on sides and bottom of water tanks.
	2 nd	Sides and bottom of tanks containing two liquids, vertical surface in contact with liquid on either side
	3 rd	Fluid Flow Parameters Types of flow – Gravity and pressure flow, Laminar, Turbulent
	4 th	Uniform, Non-uniform, Steady, Unsteady flow. Reynolds number.
4 TH	1 st	Discharge and its unit, continuity equation of flow.
	2 nd	Energy of flowing liquid: potential, kinetic and pressure energy.
	3 rd	Bernoulli's theorem : statement, assumptions, equation.
	4 th	Flow through pipes Major head loss in pipe.
5 TH	1 st	Frictional loss and its computation by Darcy's Weisbach equation Minor losses in pipe: loss at entrance, exit, sudden contraction, sudden enlargement and fittings.
	2 nd	Flow through pipes in series, pipes in parallel and Dupuit's equation for equivalent pipe.
	3 rd	Hydraulic gradient line and total energy line.
	4 th	Discharge measuring device for pipe flow: Venturi meter - construction and working.
6 TH	1 st	Discharge measurement-using Orifice, Hydraulic Coefficients of Orifice.
	2 nd	Flow through Open Channel Geometrical properties of channel section: Wetted area, wetted perimeter, hydraulic radius for rectangular and trapezoidal channel section.
	3 rd	Determination of discharge by Chezy's equation and Manning's equation.
	4 th	Conditions for most economical rectangular and trapezoidal channel section.
7 TH	1 st	Discharge measuring devices: Triangular and rectangular Notches.
	2 nd	Velocity measurement devices: current meter, floats and Pitot's tube.
	3 rd	Specific energy diagram, Froudes' Number
	4 th	Hydraulic Pumps Concept of pump, Types of pump - centrifugal, reciprocating, submersible.
8 TH	1 st	Centrifugal pump: components and working
	2 nd	Reciprocating pump: single acting and double acting, components and working.
	3 rd	Suction head, delivery head, static head, Manometric head
	4 th	Power of centrifugal pump. Selection and choice of pump
9 TH	1 st	Introduction to Hydrology Hydrology: Definition and Hydrological cycle.

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	2 nd	Rain Gauge: Symons rain gauge, automatic rain gauge,
	3 rd	Methods of calculating average rainfall: Arithmetic mean, Isohyetal, and Theissen polygon method.
	4 th	Runoff, Factors affecting Run off, Computation of run-off.
10 TH	1 st	Maximum Flood Discharge measurement: Rational and empirical methods, Simple numerical problems.
	2 nd	Yield and Dependable yield of a catchment, determination of dependable yield.
	3 rd	Crop water requirement and Reservoir Planning Irrigation and its classification.
	4 th	Crop Water requirement: Cropping seasons, Crop period, base period, Duty, Delta, CCA, GCA, intensity of irrigation, factors affecting duty.
11 TH	1 st	Problems on water requirement and capacity of canal.
	2 nd	Methods of application of irrigation water and its assessment.
	3 rd	Area capacity curve. Silting of reservoir, Rate of silting.
	4 th	factors affecting silting and control measures.
12 TH	1 st	Control levels in reservoir, Simple numerical problems on Fixing Control levels.
	2 nd	Dams and Spillways Dams and its classification:
	3 rd	Earthen dams and Gravity dams (masonry and concrete).
	4 th	Earthen Dams – Components with function, typical cross section.
13 TH	1 st	seepage through embankment and foundation and its control.
	2 nd	Methods of construction of earthen dam.
	3 rd	types of failure of earthen dam and preventive measures.
	4 th	Gravity Dams – Forces acting on dam, Theoretical and practical profile, typical cross section.
14 TH	1 st	drainage gallery, joints in gravity dam, concept of high dam and low dam.
	2 nd	Spillways-Definition, function, location.
	3 rd	types and components, Energy dissipaters
	4 th	Diversion Head Works & Canals Weirs – components, parts, types, K.T.
15 TH	1 st	weir – components and construction.
	2 nd	Diversion head works- Layout,
	3 rd	components and their function.
	4 th	Barrages – components and their functions.
16 TH	1 st	Difference between weir and Barrage.
	2 nd	Canals – Classification according to alignment and position in the canal network.
	3 rd	Cross section of canal in embankment and cutting,
	4 th	partial embankment and cutting, balancing depth, Canal lining.
17 th	1 st	Purpose, material used and its properties, advantages.
	2 nd	Cross Drainage works- Aqueduct, siphon aqueduct.
	3 rd	super passage, level crossing.
	4 th	Canal regulators- Head regulator, Cross regulator, Escape, Falls and Outlets

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