NameoftheInstitute:	**R.K. INSTITUTE OF ENGG. & TECH.**
Department :	**CIVIL ENGINEERING**
Semester:	4thSEM.
Subject Name with code:	HYDROLOGY AND IRRIGATION ENGG.
TotalNo.ofClass(Required):	45 FROM-22/12/2025 TO-18/04/2026
FacultyName:	**Mrs. GANESH SETHY**

Class No.	**Brief Description of the Topic/Chapter to be taught**	**Remarks**
1	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	
2	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. 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	
3	Fluid Flow Parameters Types of flow – Gravity and pressure flow, Laminar, Turbulent, Uniform, Non-uniform, Steady, Unsteady flow. Reynolds number.	
4	Discharge and its unit, continuity equation of flow. Energy of flowing liquid: potential, kinetic and pressure energy. Bernoulli's theorem : statement, assumptions, equation.	
5	Major head loss in pipe: Frictional loss and its computation by Darcy's Weisbach equation,	
6	Minor losses in pipe: loss at entrance, exit, sudden contraction, sudden enlargement andfittings.	
7	Flow through pipes in series, pipes in parallel and Dupuit's equation for equivalent pipe.	
8	Hydraulic gradient line and total energy line.	
9	Discharge measuring device for pipe flow: Venturi meter - construction and working	
10	Discharge measurement-using Orifice, Hydraulic Coefficients of Orifice	
11	Flow through Open Channel	

12	Geometrical properties of channel section: Wetted area, wetted perimeter, hydraulic radius for rectangular and trapezoida channel section.	
13	Determination of discharge by Chezy's equation and Manning'sequation	
14	Conditions for most economical rectangular and trapezoidal channel section..	
15	Discharge measuring devices: Triangular and rectangular Notches	
16	Discharge measuring devices: Triangular and rectangular Notches	
17	Velocity measurement devices: current meter, floats and Pitot's tube. Specific energy diagram, Froudes' Number	
18	Hydraulic Pumps Concept of pump, Types of pump - centrifugal, reciprocating, submersible.	
19	Centrifugal pump: components and working	
20	Reciprocating pump: single acting and double acting, components and working.	
21	Suction head, delivery head, static head, Manometric head	
22	Power of centrifugal pump. Selection and choice of pump.	
23	Introduction to Hydrology Hydrology: Definition and Hydrological cycle	
24	Rain Gauge: Symons rain gauge, automatic rain gauge, Methods of calculating average rainfall: Arithmetic mean, Isohyetal, and Theissen polygon method.	
25	Runoff, Factors affecting Run off, Computation of run–off.	
26	Maximum Flood Discharge measurement: Rational and empirical methods, Simple numerical problems. Yield and Dependable yield of a catchment, determination of dependable yield.	
27	Crop water requirement and Reservoir Planning Irrigation and its classification.	
28	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.	
29	Methods of application of irrigation water and its assessment.	
30	Area capacity curve.	
31	Silting of reservoir, Rate of silting, factors affecting silting and control measures. Control levels in reservoir, Simple numerical problems on Fixing Control levels)	
32	Dams and Spillways Dams and its classification: Earthen dams and Gravity dams (masonry and concrete)	
33	Earthen Dams – Components with function, typical cross	

	section, seepage through embankment and foundation and its control	
34	Methods of construction of earthen dam, types of failure of earthen dam and preventive measure	
35	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	
36	Explain briefly different systems of diesel electric power stations.	
37	Spillways-Definition, function, location, types and components, Energy dissipaters.	
38	Diversion Head Works & Canals Weirs – components, parts, types, K.T. weir – components and construction Diversion head works – Layout, components and their functio	
39	Barrages – components and their functions. Difference between weir and Barrage	
40	Canals – Classification according to alignment and position in the canal network,	
41	Canals – Classification according to alignment and position in the canal network,	
42	, Cross section of canal in embankment and cutting, partial embankment and cutting, balancing depth,	
43	. Canal lining - Purpose, material used and its properties, advantage	
44	Cross Drainage works- Aqueduct, siphon aqueduct, super passage, level crossing.	
45	Canal regulators- Head regulator, Cross regulator, Escape, Falls and Outlets	

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