LESSON PLAN2026(S)

Subject:-Hydraulics & Irrigation Engineering **Course code:- CEPC204C**

Name of faculty: -Shubhashree Jena **Class allotted: -3p/week**

Semester:-4th **Branch:-CIVI L Engg.**

Weeks	Date/period	From Date:-22/12/2025 TO 18/04/2026 Theory 1: - Topic / Lesson	Teaching Aids
1	22/12/25 To 27/12/25	**Pressure measurement and Hydrostatic pressure** **1.1** Technical terms used in Hydraulics –fluid, fluid mechanics, hydraulics, hydrostatics and hydrodynamics - ideal and real fluid, application of hydraulics. **1.2** Physical properties of fluid – density-specific volume, specific gravity, surface tension, capillarity, viscosity-Newton's law of viscosity. **1.3** 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. **1.4** Measurement of differential Pressure by different methods. **1.5**Variation of pressure with depth, Pressure diagram, hydrostatic pressure and center of pressure on immersed surfaces and on tank walls. **1.6** 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	Whiteboard & marker
2	29/12/25 To 03/01/26	**Fluid Flow Parameters** **2.1** Types of flow – Gravity and pressure flow, Laminar, Turbulent, Uniform, Non-uniform, Steady, Unsteady flow. Reynolds number. **2.2** Discharge and its unit, continuity	Whiteboard & marker

		equation of flow. **2.3** Energy of flowing liquid: potential, kinetic and pressure energy. **2.4** Bernoulli's theorem : statement, assumptions, equation.	
3	05/01/26 To 10/01/26	**Flow through pipes** **3.1** Major head loss in pipe: Frictional loss and its computation by Darcy's Weisbach equation, **3.2** Minor losses in pipe: loss at entrance, exit, sudden contraction, sudden enlargement andfittings	Whiteboard & marker
4	12/01/26 To 17/01/26	**3.3** Flow through pipes in series, pipes in parallel and Dupuit's equation for equivalent pipe. **3.4** Hydraulic gradient line and total energy line.	Whiteboard & marker
5	19/01/26 To 24/01/26	**3.5** Discharge measuring device for pipe flow: Venturi meter - construction and working. **3.6** Discharge measurement-using Orifice, HydraulicCoefficients of Orifice.	Whiteboard & marker
6	26/01/26 To 31/01/26	**Flow through Open Channel** **4.1**Geometrical properties of channel section: Wetted area, wetted perimeter, hydraulic radius for rectangular and trapezoidal channel section. **4.2** Determination of discharge by Chezy's equation and Manning's equation. **4.3** Conditions for most economical rectangular and trapezoidal channel section.	Whiteboard & marker
7	02/02/26 To 07/02/26	**4.4** Discharge measuring devices: Triangular and rectangular Notches. **4.5** Velocity measurement devices: current meter, floats and Pitot's tube. **4.6** Specific energy diagram, Froudes' Number	Whiteboard & marker

8	09/02/26 To 14/02/26	**Hydraulic Pumps** **5.1** Concept of pump, Types of pump - centrifugal, reciprocating, submersible. **5.2** Centrifugal pump: components and working **5.3** Reciprocating pump: single acting and double acting, components and working.	Whiteboard & marker
9	16/02/26 To 21/02/26	**5.4** Suction head, delivery head, static head, Manometric head **5.5**Power of centrifugal pump. **5.6** Selection and choice of pump.	Whiteboard & marker
10	23/02/26 To 28/02/26	**Introduction to Hydrology** **6.1** Hydrology: Definition and Hydrological cycle **6.2**Rain Gauge: Symons rain gauge, automatic rain gauge, **6.3** Methods of calculating average rainfall: Arithmetic mean, Isohyetal, and Theissen polygon method.	Whiteboard & marker
11	02/03/26 To 07/03/26	**6.4**Runoff, Factors affecting Run off, Computation of run–off. **6.5** Maximum Flood Discharge measurement: Rational and empirical methods, Simple numerical problems. **6.6** Yield and Dependable yield of a catchment, determination of dependable yield.	Whiteboard & marker
12	09/03/26 To 14/03/26	**Crop water requirement and Reservoir Planning** **7.1** Irrigation and its classification. **7.2** 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.	Whiteboard & marker

13	16/03/26 To 21/03/26	**7.3** Methods of application of irrigation water and its assessment. **7.4** Area capacity curve. **7.5** Silting of reservoir, Rate of silting, factors affecting silting and control measures. **7.6** Control levels in reservoir, Simple numerical problems on Fixing Control levels.	Whiteboard & marker
14	23/03/26 To 28/03/26	**Dams and Spillways** **8.1** Dams and its classification: Earthen dams and Gravity dams (masonry and concrete). **8.2** Earthen Dams – Components with function, typical cross section, seepage through embankment and foundation and its control. **8.3** Methods of construction of earthen dam, types of failure of earthen dam and preventive measures.	Whiteboard & marker
15	30/03/26 To 04/04/26	**8.4** 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. **8.5**Spillways-Definition, function, location, types and components, Energy dissipaters.	Whiteboard & marker
16	06/04/26 To 11/04/26	**Diversion Head Works & Canals** **9.1** Weirs – components, parts, types, K.T. weir – components and construction **9.2** Diversion head works – Layout, components and their function. **9.3** Barrages – components and their functions. Difference between weir and Barrage. **9.4**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,	Whiteboard & marker

		advantages.	
17	13/04/26 To 18/04/26	**9.5** Cross Drainage works- Aqueduct, siphon aqueduct, super passage, level crossing. **9.6** Canal regulators- Head regulator, Cross regulator Escape, Falls and Outlets.	**Whiteboard & marker**

Signature of HOD

Shubhashree Jena

Signature of faculty