GOVERNMENT POLYTECHNIC JAJPUR
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DEPARTMENT OF CIVIL ENGINEERINGLESSON PLAN

Disciplie: Civil Engg	**Semester: 4th**	***Name of the Teaching faculty: Ajit Kumar Behera***
Subject: Hydraulic &Irrigation Engg. Th-2	**No of Days/Week class alloted: 5 days**	**Semester from Date: 14.02.2023 To Date:23.05.2023 No of weeks:16**
Week	***Class Day***	***Topics***
1st	1st	Theory Topics
	2nd	HYDROSTATICS definition
	3rd	Use of hydrostatic
	4th	Branches of hydrostatics
	5th	Properties of fluid
2nd	1st	Density
	2nd	types of Density
	3rd	specific gravity
	4th	types of specific gravity
	5th	Numerical problems density
3rd	1st	Numerical problems specific gravity
	2nd	surface tension, capillarity
	3rd	Numerical problems on surface tension
	4th	Numerical problems on capillarity
	5th	viscosity
4th	1st	their uses
	2nd	Pressure and its measurements:
	3rd	intensity of pressure
	4th	atmospheric pressure, gauge pressure
	5th	absolute pressure and vacuum pressure
5th	1st	relationship between atmospheric pressure, absolute pressure and gauge pressure
	2nd	Pressure exerted on an immersed surface: Total pressure, resultant pressure
	3rd	expression for total pressure exerted on horizontal & vertical surface
	4th	Numerical problems on total pressure exerted on horizontal & vertical surface
	5th	KINEMATICS OF FLUID FLOW:
6th	1st	Rate of discharge, equation of continuity of liquid flow
	2nd	total energy of a liquid in motion- potential, kinetic & pressure,
	3rd	Bernoulli's theorem and its limitations

	4th	Practical applications of Bernoulli's equation. Flow over Notchesand Weirs
	5th	Notches, Weirs, types of notches and weirs
7th	1st	Discharge through different types of notches and weirs-their application
	2nd	Types of flow through the pipes: uniform and non-uniform; laminar and turbulent; steady and unsteady;
	3rd	Reynold's number and its application Losses of head of a liquid flowing through pipes
	4th	Losses of head of a liquid flowing through pipes: Different types of major and minor losses.,
	5th	Simple numerical problems on losses due to friction using Darcy's equation Flow through the Open Channels
8th	1st	Total energy lines & hydraulic gradient lines discharge formulae-
	2nd	Chezy's and Manning's equation, best economical section
	3rd	PUMPS: Type of pumps
	4th	Centrifugal pump: basic principles, operation, discharge
	5th	Types of channel sections-rectangular, trapezoidal and circular horse power & efficiency
9th	1st	Reciprocating pumps: types
	2nd	operation, discharge, horse power & efficiency
	3rd	Hydrology, Hydrology Cycle
	4th	Rainfall: types, intensity, hyetograph
	5th	Estimation of rainfall
10th	1st	rain gauges, Its types
	2nd	Concept of catchment area, types, run-off
	3rd	estimation of flood discharge by Dicken's and Ryve's formulae
	4th	Water Requirement of Crops,
		Definition of irrigation, necessity, benefits of irrigation
11th	1st	types of irrigation, Crop season
	2nd	Duty, Delta and base period their relationship
	3rd	overlap allowance, kharif and rabi crops, Gross command area, culturable command area
	4th	Intensity of Irrigation, irrigable area, time factor, crop ratio
	5th	FLOW IRRIGATION: Canal irrigation, types of canals
12th	1st	loss of water in canals, Perennial irrigation
	2nd	Different components of irrigation canals and their functions
	3rd	Sketches of different canal cross-sections 3.5 Classification of canals according to their alignment
	4th	Various types of canal lining – Advantages and disadvantages
	5th	WATER LOGGING AND DRAINAGE
13th	1st	Causes and effects of water logging detection prevention and remedies
	2nd	DIVERSION HEAD WORKS AND REGULATORY STRUCTURES
	3rd	Necessity and objectives of diversion head works
	4th	weirs and barrages
	5th	General layout, functions of different parts of barrage

14th	1st	Functions of regulatory structures
	2nd	CROSS DRAINAGE WORKS
	3rd	Functions and necessity of Cross drainage works
	4th	aqueduct, siphon, super passage, level crossing
	5th	Concept of each with help of neat sketch
15th	1st	DAMS Necessity of storage reservoirs
	2nd	types of dams Earthen dams: types, description
	3rd	causes of failure and protection measures
	4th	Gravity dam- types, description
	5th	Spillways Types (With Sketch) and necessity
16th	1st	CLASS TEST 3, PREVIOUS YEAR QUESTIONS, QUIZ

LearningResources:

Sl No.	Author Name	Name of the Book
1	Modi & Seth	Fluid Mechanics & Hydraulic machines
2	D.R. Biswal	Hydraulics & Fluid Mechanics
3	R.K.Rajput	A Text Book of Fluid Mechanics & Hydraulic machines

Ajit Kumar Baehera
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