PADMASHREE KRUTARTHA ACHARYA INSTITUTE OF ENGINEERING & TECHNOLOGY, BARGARH

LESSON PLAN

Session-2023-2024

Discipline: CIVIL ENGINEERING Engg. Semester: 4th

Subject: HYDRAULIC AND IRRIGATION ENGINEERING

Name of the Teaching Faculty: RAJESH KUMAR SAHU

Subject: HYDRAULIC AND IRRIGATION ENGINEERING No. of Days/per week class allotted : 05

Semester From Date :16-01-2024 To Date :26-04-2024 No. of Weeks : 15

Week	Class Day	Theory /Practical Topics
1	1st	Properties of fluid, Density, specific gravity
	2nd	Surface tension, capillarity
	3rd	Viscocity and their uses
	4th	Pressure and its measurements Intensity of pressure.
	5th	Atmospheric pressure, Gauge pressure
2	1st	Absolute pressure, vacuum pressure
	2nd	Relationship between atmospheric pressure, absolute pressure and gauge pressure
	3rd	Pressure head, pressure gauges
	4th	Pressure exerted on immersed surface: Total pressure
	5th	Resultant pressure, Expression for total pressure exerted on horizontal surface.
3	1st	Expression for total pressure exerted on vertical surface.
	2nd	Kinematics of fluid flow: Rate of discharge

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Week	Class Day	Theory /Practical Topics
	3rd	Eqn of continuity of liquid flow
	4th	Total energy of a liquid in motion
	5th	Potential, kinetic & pressure
4	1st	Bernoulli's theorm
	2nd	Bernoulli's theorm limitation
	3rd	Practical application of Bernoulli's Equation.
	4th	Flow over notches and wires, notches, weirs
	5th	Types of notches, weirs
5	1st	Discharge through different types of notches.
	2nd	Discharge through different types of weirs.
	3rd	It's application (No derivation)
	4th	Types of flow through pipe: - Uniform and non uniform flow

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Week	Class Day	Theory /Practical Topics
	5th	Laminar and turbulent flow, steady and unsteady
6	1st	Reynold's no and its application
	2nd	Losses of head of liquid flowing through pipes : Different type of major and minor losses
	3rd	simple numerical problem on losses due to friction using Darcy's equation.
	4th	Total energy line & hydraulic greadient line (concept)
	5th	Flow through open channel - Types of channel section - Rectangular
7	1st	Trapezoidal, Circular
	2nd	Discharge formula : chezy's and manning's equation
	3rd	Best economical section, Types of pumps: Basic principle
	4th	Operation discharge, horse power & efficiency
	5th	Receprocating pumps : Types, operation, discharge. horse power, efficiency.
8	1st	Hydrology : Hydrological cycle.

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Week	Class Day	Theory /Practical Topics
	2nd	Rainfall - Types, intensity, hyetorograph
	3rd	Estimatin of rainfall, Raingauges
	4th	Raingauges types, concept of catchment area
	5th	Types, runoff, estimatin of flood discharge by Dicken's and Ryves formula.
9	1st	water req. of crop:- Definitin of irrigation, necessity & Benifits
	2nd	Types of irrigatin: Crop season, Duty, Delta, Base period and their relationship.
	3rd	Overlap allowances
	4th	Kharif and Rabi crops
	5th	GCA, CCA, Intensity of Irrigatin, Irrigable area, Time factor, Crop ratio
10	1st	Flow Irrigation : canal Irrigatin, Types of canals
	2nd	Loss of water in canals, percinnial irrigation
	3rd	Components of irrigatin canals & their function

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Week	Class Day	Theory /Practical Topics
	4th	Sketches of different canal cross-section
	5th	Classification of canals according to their alignment
11	1st	Various types of canal lining
	2nd	Advantages and disadvantages of canal lining
	3rd	Water logging and drainage: Causes and effect of water logging
	4th	Detection, prevention and remedies
	5th	Diversion head work & regulatory structure, Necessity & objective of diversion head work
12	1st	weirs and barrages
	2nd	General Layout, Function of different parts of barrage
	3rd	Silting & Scouring
	4th	function of regulatory structure
	5th	Cross drainage work, function & Necessity

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Week	Class Day	Theory /Practical Topics
13	1st	Aqueduct, Siphon
	2nd	Supper passage, Level crossing
	3rd	concept with neat sketch
	4th	Necessity of storage reservoir
	5th	Types of dams
14	1st	Earthen Dams - Types
	2nd	Description, causes of failure
	3rd	Protection measures
	4th	Gravity Dam, Types, Description
	5th	Causes of failure
15	1st	Protection measures
	2nd	Spillways

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Week	Class Day	Theory /Practical Topics
	3rd	Types of spillways
	4th	Sketches of spillways various types.
	5th	Spillway necessity

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