

Badriprasad Institute of Technology, Sambalpur

Lesson plan for Theory -2, Hydraulics & Irrigation Engineering

Semester & Branch : 4th Sem Civil Engineering

Total Periods-60

Name of the faculty : Mr. Firoz Kumar Patel

No of periods /week-4

WEEK	CLASS DAY	THEORY TOPICS
1ST	1st	PART: A (Hydraulics)
		HYDROSTATICS:
		Properties of fluid: density, specific gravity, surface tension, capillarity, viscosity and their uses
	2nd	Pressure and its measurements: intensity of pressure, atmospheric pressure, gauge pressure, absolute pressure and vacuum pressure;
	3rd	relationship between atmospheric pressure, absolute pressure and gauge pressure; pressure head; pressure gauges.
	4th	Pressure exerted on an immersed surface: Total pressure, resultant pressure, expression for total pressure exerted on horizontal & vertical surface.
2ND	1st	Continue of 4th class
	2nd	KINEMATICS OF FLUID FLOW:
		Basic equation of fluid flow and their application:
	3rd	Rate of discharge, equation of continuity of liquid flow, total energy of a liquid in motion- potential, kinetic & pressure,
4th	Bernoulli's theorem and its limitations. Practical applications of Bernoulli's equation.	
3RD	1st	Continue of 4th class
	2nd	Flow over Notches and Weirs: Notches, Weirs, types of notches and weirs,
	3rd	Discharge through different types of notches and weirs-their application (No Derivation)
	4th	Types of flow through the pipes: uniform and non uniform; laminar and turbulent;
4TH	1st	steady and unsteady; Reynold's number and its application
	2nd	Losses of head of a liquid flowing through pipes: Different types of major and minor losses.
	3rd	Simple numerical problems on losses due to friction using Darcy's equation, Total energy lines & hydraulic gradient lines (Concept Only).
	4th	Continue of 3rd class
5TH	1st	Flow through the Open Channels: Types of channel sections-rectangular, trapezoidal and circular
	2nd	discharge formulae- Chezy's and Manning's equation, Best economical section.
	3rd	PUMPS:
		Type of pumps
4th	Centrifugal pump: basic principles, operation, discharge, horse power & efficiency.	
	4th	Continue of 3rd class

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6TH	1st	Reciprocating pumps: types, operation, discharge, horse power & efficiency
	2nd	Continue of 4th class
	3rd	PART: B (Irrigation Engineering)
		Hydrology
		Hydrology Cycle
4th	Rainfall: types, intensity, hyetograph	
7TH	1st	Estimation of rainfall, rain gauges, Its types(concept only),
	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, types of irrigation		
8TH	1st	Continue of 2nd class
	2nd	Crop season
	3rd	Duty, Delta and base period their relationship, overlap allowance, kharif and rabi crops
	4th	Gross command area, culturable command area, Intensity of Irrigation, irrigable area, time factor, crop ratio
9TH	1st	FLOW IRRIGATION
		Canal irrigation, types of canals, loss of water in canals
	2nd	Perennial irrigation
	3rd	Different components of irrigation canals and their functions
10TH	4th	Sketches of different canal cross-sections
	1st	Classification of canals according to their alignment
	2nd	Various types of canal lining – Advantages and disadvantages
	3rd	Continue of 2nd class
11TH	4th	WATER LOGGING AND DRAINAGE :
		Causes and effects of water logging
	1st	detection, prevention and remedies
	2nd	Continue of 1st class
11TH	3rd	DIVERSION HEAD WORKS AND REGULATORY STRUCTURES
		Necessity and objectives of diversion head works
	4th	Continue of 3rd class

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12TH	1st	weirs and barrages
	2nd	General layout, functions of different parts of barrage
	3rd	Continue of 2nd class
	4th	Silting and scouring
13TH	1st	Functions of regulatory structures
	2nd	Continue of 1st class
	3rd	CROSS DRAINAGE WORKS : Functions and necessity of Cross drainage works - aqueduct, siphon
	4th	super-passage, level crossing
14TH	1st	Concept of each with help of neat sketch
	2nd	DAMS Necessity of storage reservoirs, types of dams
	3rd	Earthen dams: types, description,
	4th	continue-causes of failure and protection measures
15TH	1st	Gravity dam- types, description
	2nd	continue- Causes of failure and protection measures
	3rd	Spillways- Types (With Sketch) and necessity.
	4th	Revision

Sign of Faculty

Sign of HOD