ACADEMIC SESSION : SUMMER 2023

Discipline : Civil Engg.	Semester : 4th	Name of the Teaching Faculty : Saibali Mishra
Subject : Hydraulics & Irrigation Engineering	No. of days / week class allotted	Semester From date: 14/02/2023 to 23/05/2023 Nos. of Weeks : 14
Week	**Class Day**	**Theory/ Practical Topics**
1st	1st	Properties of fluid- density, specific gravity,
	2nd	viscosity and their uses
	3rd	Pressure and its measurements- intensity of pressure
	4th	atmospheric pressure, gauge pressure.
	5th	absolute pressure and vacuum pressure
2nd	1st	relationship between atmospheric pressure .
	2nd	absolute pressure and gauge pressure
	3rd	pressure head; pressure gauges.
	4th	equation of continuity of liquid flow
	5th	surface tension,
3rd	1st	capillarity
	2nd	Revision of properties of fluid
	3rd	Basic equation of fluid flow and their application: Rate of discharge
	4th	relationship between atmospheric pressure .
	5th	absolute pressure and gauge pressure
4th	1st	Hydrology Cycle
	2nd	Rainfall: types, intensity, hyetograph
	3rd	Estimation of rainfall, rain gauges
	4th	Flow over Weirs -Weirs, types of notches and weirs
	5th	Discharge through different types of notches and weirs-

		their application
5th	1st	Pressure exerted on an immersed surface: Total pressure, resultant pressure
	2nd	expression for total pressure exerted on horizontal & vertical surface
	3rd	Basic equation of fluid flow and their application: Rate of discharge
	4th	total energy of a liquid in motion- potential, kinetic & pressure
	5th	Bernoulli's theorem and its limitations.
6th	1st	Practical applications of Bernoulli's equation.
	2nd	Flow over Notches: Notches
	3rd	Flow over Weirs -Weirs, types of notches and weirs
	4th	Discharge through different types of notches and weirs- their application
	5th	Types of flow through the pipes: uniform and non uniform; laminar and turbulent
7th	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
	4th	Total energy lines & hydraulic gradient lines
	5th	Flow through the Open Channels
8th	1st	Types of channel sections -rectangular
	2nd	Types of channel sections -trapezoidal and circular,
	3rd	discharge formulae- Chezy's and Manning's equation
	4th	Best economical section
	5th	Type of pumps

9th	1st	Centrifugal pump: basic principles
	2nd	operation, discharge, horse power & efficiency of centrifugal pump
	3rd	Reciprocating pumps: types
	4th	operation, discharge, horse power & efficiency of reciprocating pump
	5th	Hydrology Cycle
10th	1st	Rainfall: types, intensity, hyetograph
	2nd	Estimation of rainfall, rain gauges
	3rd	Rain gauges types(concept only) Concept of catchment area, types,
	4th	Run-off, estimation of flood discharge by Dicken's and Ryve's formula
	5th	Definition of irrigation, necessity, benefits of irrigation
11th	1st	types of irrigation
	2nd	Crop season Duty, Delta and base period their relationship
	3rd	overlap allowance, kharif and rabi crops
	4th	Gross command area, culturable command area, Intensity of Irrigation
	5th	irrigable area, time factor, crop ratio
11th	1st	Canal irrigation, types of canals
	2nd	loss of water in canals
	3rd	Perennial irrigation
	4th	Different components of irrigation canals and their

		functions
	5th	Sketches of different canal cross-sections
12th	1st	Classification of canals according to their alignment
	2nd	Various types of canal lining – Advantages and disadvantages
	3rd	Causes and effects of water logging
	4th	detection, prevention and remedies of waterlogging
	5th	Necessity and objectives of diversion head works
13th	1st	weirs and barrages
	2nd	General layout, functions of different parts of barrage
	3rd	Functions of regulatory structures
	4th	Silting and scouring ,concept of cross drainage works
	5th	Functions and necessity of Cross drainage works
14th	1st	aqueduct, siphon, super passage, level crossing
	2nd	Concept of each with help of neat sketch
	3rd	Necessity of storage reservoirs, types of dams
	4th	Earthen dams: types, description
	5th	Functions of regulatory structures
15th	1st	Silting and scouring ,concept of cross drainage works
	2nd	causes of failure and protection measures of earthen dam
	3rd	Gravity dam- types, description
	4th	Causes of failure and protection measures.
	5th	Spillways- Types (With Sketch) and necessity