IDEAL SCHOOL OF ENGINEERING,RETANG-752054

DISCIPLINE: **CIVIL ENGINEERING**	**SEMESTER: 4TH SEM**	**NAME OF THE TEACHING FACULTY:** ER. ADARSHI MANISHA BISWAL & ER. ITISMITA SWAIN
SUBJECT: **HYDRAULICS AND IRRIGATION ENGINEERING (TH-2)**	No of Days/Per week class allotted: **5 Class P/W(75)**	Semester From Date: 13/02/2023 To Date: 23/05/2023 No. Of Weeks: **15**
WEEK	**CLASS DAY**	**THEORY TOPICS PART-B (HYDRAULICS)**
1st	1st	**HYDROSTATICS:** 1.1 **Properties of fluid:** density, specific gravity, surface tension, capillarity, viscosity and their uses
	2nd	1.2 **Pressure and its measurements:** intensity of pressure, atmospheric pressure, gauge pressure
	3rd	Absolute pressure and vacuum pressure; relationship between atmospheric pressure, absolute pressure and gauge pressure; pressure head; pressure gauges.
	4th	**1.3 Pressure exerted on an immersed surface:** Total pressure, resultant pressure, expression for total pressure exerted on horizontal & vertical surface.
	5th	**KINEMATICS OF FLUID FLOW:** **2.1 Basic equation of fluid flow and their application:** Rate of discharge
2nd	1st	Equation of continuity of liquid flow, total energy of a liquid in motion- potential
	2nd	Kinetic & pressure, Bernoulli's theorem and its limitations. Practical applications of Bernoulli's equation.
	3rd	**2.2 Flow over Notches and Weirs:** Notches, Weirs
	4th	Types of notches and weirs, Discharge through different types of notches and weirs-their application (No Derivation)
	5th	**2.3 Types of flow through the pipes:** uniform and non uniform
3rd		
	1st	Laminar and turbulent; steady and unsteady; Reynold's number and its application
	2nd	Repeat Class About Notches And Weirs.
	3rd	**2.4 Losses of head of a liquid flowing through pipes:** Different types of major and minor losses.

	4th	Doubt Class About losses in head of liquid flowing.
	5th	Simple numerical problems on losses due to friction using Darcy's equation, Total energy lines & hydraulic gradient lines (Concept Only).
4th	1st	Briefing About equations (Darcy)
	2nd	**2.5 Flow through the Open Channels:** Types of channel sections-rectangular
	3rd	Discussion About Open Channel.
	4th	Trapezoidal and circular, discharge formulae- Chezy's and Manning's equation, Best economical section.
	5th	Discussion about last class
5th	1st	**2.4 Losses of head of a liquid flowing through pipes:** Different types of major and minor losses.
	2nd	Simple numerical problems on losses due to friction using Darcy's equation
	3rd	Briefing About some problems
	4th	Total energy lines & hydraulic gradient lines (Concept Only).
	5th	Revision of Last Class About Gradient
6th	1st	**2.5 Flow through the Open Channels:** Types of channel sections-rectangular
	2nd	Trapezoidal and circular
	3rd	Discharge formulae- Chezy's and Manning's equation
	4th	Best economical section.
	5th	Revision of Last Class About Channel
7th	1st	**PUMPS:** **3.1 Type of pumps**
	2nd	**3.2 Centrifugal pump:** basic principles
	3rd	Operation, discharge, horse power & efficiency
	4th	**3.3 Reciprocating pumps:** types, operation, Discharge, horse power & efficiency
	5th	Discussing About Pump and its Types

<u>PART-B</u> (IRRIGATION ENGINEERING)

8th	1st	**Hydrology** 1.1 Hydrology Cycle
	2nd	1.2 Rainfall: types, intensity, hyetograph
	3rd	1.3 Estimation of rainfall, rain gauges, Its types(concept only),

	4th	1.4 Concept of catchment area, types, run-off, estimation of flood discharge by Dicken's and Ryve's formulae
	5th	Revision Class About hydrology.
9th	1st	**Water Requirement of Crops** 2.1 Definition of irrigation, necessity, benefits of irrigation, types of irrigation 2.2 Crop season
	2nd	Revision of Last class About Benefits of irrigation
	3rd	2.3 Duty, Delta and base period their relationship, overlap allowance, kharif and rabi crops
	4th	2.4 Gross command area, culturable command area, Intensity of Irrigation, irrigable area, time factor, crop ratio
	5th	Revision of Last class About GCA
10th	1st	**FLOW IRRIGATION** 3.1 Canal irrigation, types of canals, loss of water in canals 3.2 Perennial irrigation
	2nd	3.3 Different components of irrigation canals and their functions
	3rd	3.4 Sketches of different canal cross-sections
	4th	3.5 Classification of canals according to their alignment, Various types of canal lining – Advantages and disadvantages
	5th	Briefing About Last Class Flow irrigation.
11th	1st	**WATER LOGGING AND DRAINAGE :** 4.1 Causes and effects of water logging,
		detection, prevention and remedies
	2nd	Revision About Last Class Water Logging And Drainage.
	3rd	**DIVERSION HEAD WORKS AND REGULATORY STRUCTURES** 5.1 Necessity and objectives of diversion head works
	4th	Weirs and Barrages
	5th	Revision of Last Class About Barrages And Weirs.
	1st	5.2 General layout, functions of different parts of barrage

12th	2nd	Revision Class About Different Part of Barrages.
	3rd	5.3 Silting and scouring
	4th	5.4 Functions of regulatory structures
	5th	Discussing About Regulatory Structure.
13th	1st	**CROSS DRAINAGE WORKS :** 6.1 Functions and necessity of Cross drainage works - aqueduct
	2nd	Siphon, Super-passage, Level crossing
	3rd	Discussing About Necessity Of Cross Drainage.
	4th	6.2 Concept of each with help of neat sketch
	5th	Revision Class About Siphon .
14th	1st	DAMS 7.1 Necessity of storage reservoirs
	2nd	Types of dams And Reservoirs.
	3rd	Revision About last Class.
	4th	7.2 Earthen dams: types, description, causes of failure and protection measures.
	5th	Revision About last class.
15th	1st	7.3 Gravity dam- types, description, Causes of failure and protection measures.
	2nd	Revision Last About Gravity Dam.
	3rd	7.4 Spillways- Types (With Sketch).
	4th	Necessity of Spillway And Discussing About Types.
	5th	Revision About Last Class Spillway.