

LESSON PLAN		
DISCIPLINE:CIVIL	SEMESTER: 4TH SEC A	NAME OF THE TEACHING FACULTY: MANAS RANJAN SAHOO
SUBJECT:HYDRAULIC AND IRRIGATION ENGINEERING	NO.OF DAYS/PER WEEK CLASS ALLOTTED:5	SEMESTER- 4TH SEM SEC A FROM: 13.02.2023 TO 23.05.2023 NO. OF WEEKS- 15
WEEK	CLASS DAY	THEORY/PRACTICAL
week 1		PART: A (Hydraulics And Machines)
		1. HYDROSTATICS
	1st	1.1 Properties of fluid: density, specific gravity, surface tension, capillarity, viscosity and their uses
	2nd	1.1 Properties of fluid: density, specific gravity, surface tension, capillarity, viscosity and their uses
	3rd	1.1 Properties of fluid: density, specific gravity, surface tension, capillarity, viscosity and their uses
week2	4th	1.1 Properties of fluid: density, specific gravity, surface tension, capillarity, viscosity and their uses
	1st	1.2 Pressure and its measurements: intensity of pressure, atmospheric pressure, gauge pressure, absolute pressure and vacuum pressure; relationship between atmospheric pressure, absolute pressure and gauge pressure; pressure head; pressure
	2nd	1.2 Pressure and its measurements: intensity of pressure, atmospheric pressure, gauge pressure, absolute pressure and vacuum pressure; relationship between atmospheric pressure, absolute pressure and gauge pressure; pressure head; pressure
	3rd	1.2 Pressure and its measurements: intensity of pressure, atmospheric pressure, gauge pressure, absolute pressure and vacuum pressure; relationship between atmospheric pressure, absolute pressure and gauge pressure; pressure head; pressure
week 3	4th	1.2 Pressure and its measurements: intensity of pressure, atmospheric pressure, gauge pressure, absolute pressure and vacuum pressure; relationship between atmospheric pressure, absolute pressure and gauge pressure; pressure head; pressure
	1st	1.3 Pressure exerted on an immersed surface: Total pressure, resultant pressure, expression for total pressure exerted on horizontal & vertical surface.
	2nd	1.3 Pressure exerted on an immersed surface: Total pressure, resultant pressure, expression for total pressure exerted on horizontal & vertical surface. 2. KINEMATICS OF FLUID FLOW: 2.1 Basic equation of fluid flow and their application: Rate of discharge, equation of continuity of liquid flow, total energy of a liquid in motion- potential, kinetic & pressure, Bernoulli's theorem and its limitations. Practical applications of Bernoulli's equation.

	3rd	2.1 Basic equation of fluid flow and their application: Rate of discharge, equation of continuity of liquid flow, total energy of a liquid in motion- potential, kinetic & pressure, Bernoulli's theorem and its limitations. Practical applications of Bernoulli's equation.
	4th	2.1 Basic equation of fluid flow and their application: Rate of discharge, equation of continuity of liquid flow, total energy of a liquid in motion- potential, kinetic & pressure, Bernoulli's theorem and its limitations. Practical applications of Bernoulli's equation.
week 4	1st	2.1 Basic equation of fluid flow and their application: Rate of discharge, equation of continuity of liquid flow, total energy of a liquid in motion- potential, kinetic & pressure, Bernoulli's theorem and its limitations. Practical applications of Bernoulli's equation.
	3rd	2.1 Basic equation of fluid flow and their application: Rate of discharge, equation of continuity of liquid flow, total energy of a liquid in motion- potential, kinetic & pressure, Bernoulli's theorem and its limitations. Practical applications of Bernoulli's equation.
	4th	2.1 Basic equation of fluid flow and their application: Rate of discharge, equation of continuity of liquid flow, total energy of a liquid in motion- potential, kinetic & pressure, Bernoulli's theorem and its limitations. Practical applications of Bernoulli's equation.
week 5	1st	2.2 Flow over Notches and Weirs: Notches, Weirs, types of notches and weirs, Discharge through different types of notches and weirs-their application (No Derivation)
	2nd	2.2 Flow over Notches and Weirs: Notches, Weirs, types of notches and weirs, Discharge through different types of notches and weirs-their application (No Derivation)
	3rd	2.3 Types of flow through the pipes: uniform and non uniform; laminar and turbulent; steady and unsteady; Reynold's number and its application
	4th	2.3 Types of flow through the pipes: uniform and non uniform; laminar and turbulent; steady and unsteady; Reynold's number and its application
week 6	1st	2.4 Losses of head of a liquid flowing through pipes: Different types of major and minor losses. Simple numerical problems on losses due to friction using Darcy's equation, Total energy lines &
	2nd	2.4 Losses of head of a liquid flowing through pipes: Different types of major and minor losses. Simple numerical problems on losses due to friction using Darcy's equation, Total energy lines & hydraulic gradient lines (Concept Only).
	3rd	2.4 Losses of head of a liquid flowing through pipes: Different types of major and minor losses. Simple numerical problems on losses due to friction using Darcy's equation, Total energy lines & hydraulic gradient lines (Concept Only).

	4th	2.4 Losses of head of a liquid flowing through pipes: Different types of major and minor losses. Simple numerical problems on losses due to friction using Darcy's equation, Total energy lines & hydraulic gradient lines (Concept Only).
week 7	1st	2.5 Flow through the Open Channels: Types of channel sections- rectangular, trapezoidal and circular, discharge formulae- Chezy's and Manning's equation, Best economical section.
	2nd	2.5 Flow through the Open Channels: Types of channel sections- rectangular, trapezoidal and circular, discharge formulae- Chezy's and Manning's equation, Best economical section.
		3. PUMPS
		3.1 Type of pumps
	4th	3.1 Type of pumps
week 8	1st	3.2 Centrifugal pump: basic principles, operation, discharge, horse power & efficiency
	2nd	3.3 Reciprocating pumps: types, operation, discharge, horse power & efficiency
		PART: B (Irrigation Engineering)
		1. Hydrology
	3rd	1.1 Hydrology Cycle
	1st	1.2 Rainfall: types, intensity, hyetograph
	2nd	1.3 Estimation of rainfall, rain gauges, its types (concepts only) 1.4 Concept of catchment area, types, run-off, estimation of flood discharge by Dicken's and Ryve's formulae
		2. Water Requirement of Crops
	3rd	2.1 Definition of irrigation, necessity, benefits of irrigation, types of irrigation
	1st	2.2 Crop season 2.3 Duty, Delta and base period their relationship, overlap allowance, kharif and rabi crops
	2nd	2.3 Duty, Delta and base period their relationship, overlap allowance, kharif and rabi crops 2.4 Gross command area, culturable command area, Intensity of Irrigation, irrigable area, time factor, crop ratio
		3. FLOW IRRIGATION
	3rd	3.1 Canal irrigation, types of canals, loss of water in canals
	4th	3.2 Perennial irrigation
	1st	3.3 Different components of irrigation canals and their functions 3.4 Sketches of different canal cross-sections
	2nd	3.5 Classification of canals according to their alignment, Various types of canal lining – Advantages and disadvantages

week 11	3rd	3.5 Classification of canals according to their alignment, Various types of canal lining – Advantages and disadvantages
	4th	3.5 Classification of canals according to their alignment, Various types of canal lining – Advantages and disadvantages
week 12	1st	4.WATER LOGGING AND DRAINAGE
		4.1 Causes and effects of water logging, detection, prevention and remedies
	2nd	4.1 Causes and effects of water logging, detection, prevention and remedies
		5. DIVERSION HEAD WORKS AND REGULATORY STRUCTURES
		5.1 Necessity and objectives of diversion head works, weirs and barrages
	3rd	5.1 Necessity and objectives of diversion head works, weirs and barrages
week 13	1st	5.2 General layout, functions of different parts of barrage
	2nd	5.2 General layout, functions of different parts of barrage
	3rd	5.3 Silting and scouring
	4th	5.3 Silting and scouring
week 14	1st	5.4 Functions of regulatory structures
		6. CROSS DRAINAGE WORKS
	2nd	6.1 Functions and necessity of Cross drainage works - aqueduct, siphon, super-passage, level crossing
	3rd	6.1 Functions and necessity of Cross drainage works - aqueduct, siphon, super-passage, level crossing
week 15	1st	6.1 Functions and necessity of Cross drainage works - aqueduct, siphon, super-passage, level crossing
	2nd	6.2 Concept of each with help of neat sketch
EXTRA CLASSES REQUIRED		6.2 Concept of each with help of neat sketch
		7.DAMS
		7.1 Necessity of storage reservoirs, types of dams
		7.2 Earthen dams: types, description, causes of failure and protection measures.
		7.3 Gravity dam- types, description, Causes of failure and protection measures.
		7.4 Spillways- Types (With Sketch) and necessity.

Manas Ranjan Sahoo

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