

## LESSON PLAN FOR SUMMER 2023

DISCIPLINE:- CIVIL ENGG.	SEMESTER:-4TH SEM SEC B	NAME OF THE TEACHING FACULTY:- JASODHARA SAHOO (PTGF)
SUBJECT:- HYDRAULICS & IRRIGATION ENGG. (TH-2)	NO. OF DAYS/PER WEEK CLASS ALLOTTED:- 5T	SEMESTER - 4TH Sem SEC B FROM DATE-13/02/2022 TO DATE- 23/05/2023 NO. OF WEEKS-15WEEKS
WEEK	CLASS DAY	THEORY TOPICS
		PART: A (Hydraulics And Machines)
		1.0 HYDROSTATICS:(12P)
1ST WEEK	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
	4th	1.1 Properties of fluid: density, specific gravity, surface tension, capillarity, viscosity and their uses
2nd WEEK	1st	1.2 Pressure and its measurement:intensity of pressure ,atmospheric pressure,gauge pressure ,absolute pressure and vacuum pressure Relationship between atmospheric pressure, absolute pressure and gauge pressure,presure head;pressure gauges
	2nd	1.2 Pressure and its measurement:intensity of pressure ,atmospheric pressure,gauge pressure ,absolute pressure and vacuum pressure Relationship between atmospheric pressure, absolute pressure and gauge pressure,presure head;pressure gauges
	3rd	1.2 Pressure and its measurement:intensity of pressure ,atmospheric pressure,gauge pressure ,absolute pressure and vacuum pressure Relationship between atmospheric pressure, absolute pressure and gauge pressure,presure head;pressure gauges
	4th	1.2 Pressure and its measurement:intensity of pressure ,atmospheric pressure,gauge pressure ,absolute pressure and vacuum pressure Relationship between atmospheric pressure, absolute pressure and gauge pressure,presure head;pressure gauges
3rd WEEK	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.
		2.0 KINEMATICS OF FLUID FLOW:(18P)
	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.

<b>3rd WEEK</b>	<b>4th</b>	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.
<b>4th WEEK</b>	<b>1st</b>	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.
	<b>4th</b>	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.
<b>5th WEEK</b>	<b>1st</b>	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)
	<b>2nd</b>	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)
	<b>3rd</b>	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)
	<b>4th</b>	2.3 Types of flow through the pipes: uniform and non uniform; laminar and turbulent; steady and unsteady; Reynold's number and its application
<b>6th WEEK</b>	<b>1st</b>	2.3 Types of flow through the pipes: uniform and non uniform; laminar and turbulent; steady and unsteady; Reynold's number and its application
	<b>2nd</b>	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).
	<b>3rd</b>	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).
	<b>4th</b>	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.
<b>7th WEEK</b>	<b>1st</b>	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.
	<b>2nd</b>	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.
		<b>PART-B IRRIGATION ENGG.</b>
		<b>1. HYDROLOGY (4P)</b>
	<b>3rd</b>	1.1 Hydrology Cycle
<b>4th</b>	1.2 Rainfall: types, intensity, hyetograph 1.3 Estimation of rain fall, rain gauges, its types (concept only)	



8th WEEK	1st	1.4 Concept of catchment area,types,runoff,estimation of flood or discharge by dicken's and ryve's formulae
		<b>2. WATER REQUIREMENT OF CROPS (4P)</b>
	2nd	2.1 Defination of irrigation,necessity,benefits of irrigation,types of irrigation
	3rd	2.2 Crop season
9th WEEK	1st	2.3 Duty,delta and base period their relationship,overlap allowance, kharif and rabi crops
	2nd	2.4 Gross command area, culturable command area, intensity of irrigation,irrigable area,time factor, crop ratio
		<b>PART: A (Hydraulics And Machines)</b>
		<b>3-PUMPS: (5P)</b>
	3rd	3.1 Type of pumps
10th WEEK	1st	3.2 Centrifugal pump: basic principles,
	2nd	3.2 operation, discharge, horse power & efficiency.
	3rd	3.3 Reciprocating pumps: types,operation, discharge, horse power & efficiency
	4th	3.3 Reciprocating pumps: types,operation, discharge, horse power & efficiency
		<b>PART-B IRRIGATION ENGG.</b>
		<b>3. FLOW IRRIGATION(7P)</b>
	3.1 Canal irrigation, types of canals, loss of water in canals	
11th WEEK	1st	3.2 Perennial irrigation
	2nd	3.3 Different components of irrigation canals and their functions
	3rd	3.3 Different components of irrigation canals and their functions
	4th	3.4 Sketches of different canal cross-sections
12th WEEK	1st	3.5 Classification of canals according to their alignment, Various types of canal lining – Advantages and disadvantages
		<b>4.WATER LOGGING &amp; DRAINAGE(2P)</b>
	2nd	4.1 Causes and effects of water logging, detection, prevention and remedies
	3rd	4.1 Causes and effects of water logging, detection, prevention and remedies
		<b>5.DIVERSION HEAD WORKS AND REGULATORY STRUCTURES(8P)</b>
13th WEEK	1st	5.1 Necessity and objectives of diversion head works, weirs and barrages
	2nd	5.1 Necessity and objectives of diversion head works, weirs and barrages
	3rd	5.2 General layout, functions of different parts of barrage
	4th	5.2 General layout, functions of different parts of barrage
14th WEEK	1st	5.3 Silting and scouring
	2nd	5.4 Functions of regulatory structures
	3rd	5.4 Functions of regulatory structures
		<b>6.CROSS DRAINAGE WORKS (7P)</b>
15th WEEK	1st	6.1 Functions and necessity of cross drainage works
	2nd	6.1 Aqueduct, syphon
EXTRA CLASSES REQUIRED		6.1 Super passage, level crossing ,
		6.2 Concept of each with help of neat sketch
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	<b>7. DAMS (8P)</b>
	7.1 Necessity of storage reservoirs
	7.1 Types of dams
	7.2 Earthen dams: types, description
	7.2 Causes of failure and protection measures
	7.3 Gravity dam - types, description
	7.3 Causes of failure and protection measures
	7.4 Spillway types
	7.4 Spillways necessity

*Jasodhara Sahoo*  
Signature of the faculty