



LESSON PLAN : TYPE-1 HYDRAULICS & IRRIGATION ENGINEERING, SESSION -2023-2024 (SUMMER 2023) BATCH-2021-2024(4th Semester)

Discipline: Civil Engineering	Semester: 4th	Name of the Teaching Faculty: Gouranga Charan Pradhan, Sr. Lect. In Civil Engg.
Subject: Th.2- HYDRAULICS & IRRIGATION ENGINEERING	No. of days/ per week class allotted: 5	Semester From Date : 14-02-2023 to Date: 31-05-2023 No. of Weeks: 15
Week	Class Day	Theory/ Practical Topics PART: A (Hydraulics)
		<b>1 HYDROSTATICS:</b>
1ST	1	1.1 Properties of fluid: density, specific gravity, surface tension, capillarity, viscosity and their uses
	2	1.1 Properties of fluid: density, specific gravity, surface tension, capillarity, viscosity and their uses
	3	1.1 Properties of fluid: density, specific gravity, surface tension, capillarity, viscosity and their uses
	4	1.1 Properties of fluid: density, specific gravity, surface tension, capillarity, viscosity and their uses
	5	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 gauges.
2ND	1	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 gauges.
	2	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 gauges.
	3	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 gauges.
	4	1.3 Pressure exerted on an immersed surface: Total pressure, resultant pressure, expression for total pressure exerted on horizontal & vertical surface.
	5	1.3 Pressure exerted on an immersed surface: Total pressure, resultant pressure, expression for total pressure exerted on horizontal & vertical surface.
3RD	1	1.3 Pressure exerted on an immersed surface: Total pressure, resultant pressure, expression for total pressure exerted on horizontal & vertical surface.
	2	1.3 Pressure exerted on an immersed surface: Total pressure, resultant pressure, expression for total pressure exerted on horizontal & vertical surface.
		<b>2 KINEMATICS OF FLUID FLOW:</b>
	3	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.
	4	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.
	5	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	1	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.
	2	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)
	3	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)
	4	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)
	5	2.3 Types of flow through the pipes: uniform and non uniform; laminar and turbulent; steady and unsteady; Reynold's number and its application
5TH	1	2.3 Types of flow through the pipes: uniform and non uniform; laminar and turbulent; steady and unsteady; Reynold's number and its application

	2	2.3 Types of flow through the pipes: uniform and non uniform; laminar and turbulent; steady and unsteady; Reynold's number and its application
	3	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).
	4	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).
	5	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).
6TH	1	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).
	2	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	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.
	4	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.
	5	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.
7TH		<b>3 PUMPS:</b>
	1	3.1 Type of pumps
	2	3.2 Centrifugal pump: basic principles, operation, discharge, horse power & efficiency.
	3	3.2 Centrifugal pump: basic principles, operation, discharge, horse power & efficiency.
	4	3.3 Reciprocating pumps: types, operation, discharge, horse power & efficiency
	5	3.3 Reciprocating pumps: types, operation, discharge, horse power & efficiency
8TH		<b>PART: B (Irrigation Engineering)</b>
	1	<b>1 Hydrology</b>
	2	1.1 Hydrology Cycle
	3	1.2 Rainfall: types, intensity, hyetograph
	4	1.3 Estimation of rainfall, rain gauges, Its types(concept only), 1.4 Concept of catchment area, types, run-off, estimation of flood discharge by Dicken's and Ryve's formulae
		<b>2 Water Requirement of Crops</b>
9TH	1	2.1 Definition of irrigation, necessity, benefits of irrigation, types of irrigation
	2	2.2 Crop season
	3	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
	4	<b>3 FLOW IRRIGATION</b>
	5	3.1 Canal irrigation, types of canals, loss of water in canals
10TH	1	3.1 Canal irrigation, types of canals, loss of water in canals
	2	3.2 Perennial irrigation
	3	3.3 Different components of irrigation canals and their functions
	4	3.4 Sketches of different canal cross-sections
	5	3.5 Classification of canals according to their alignment, Various types of canal lining – Advantages and disadvantages
		3.5 Classification of canals according to their alignment, Various types of canal lining – Advantages and disadvantages
11TH	1	<b>4 WATER LOGGING AND DRAINAGE :</b>
	2	4.1 Causes and effects of water logging, detection, prevention and remedies
		4.1 Causes and effects of water logging, detection, prevention and remedies
	3	<b>5 DIVERSION HEAD WORKS AND REGULATORY STRUCTURES</b>
	4	5.1 Necessity and objectives of diversion head works, weirs and barrages
	5	5.1 Necessity and objectives of diversion head works, weirs and barrages
12TH	1	5.2 General layout, functions of different parts of barrage
	2	5.2 General layout, functions of different parts of barrage
		5.3 Silting and scouring

	3	5.3 Silting and scouring
	4	5.4 Functions of regulatory structures
	5	5.4 Functions of regulatory structures
		<b>6 CROSS DRAINAGE WORKS :</b>
13TH	1	6.1 Functions and necessity of Cross drainage works - aqueduct, siphon, super-passage, level crossing
	2	6.1 Functions and necessity of Cross drainage works - aqueduct, siphon, super-passage, level crossing
	3	6.1 Functions and necessity of Cross drainage works - aqueduct, siphon, super-passage, level crossing
	4	6.1 Functions and necessity of Cross drainage works - aqueduct, siphon, super-passage, level crossing
	5	6.2 Concept of each with help of neat sketch
14TH	1	6.2 Concept of each with help of neat sketch
	2	6.2 Concept of each with help of neat sketch
		<b>7 DAMS</b>
	3	7.1 Necessity of storage reservoirs, types of dams
	4	7.1 Necessity of storage reservoirs, types of dams
15TH	5	7.2 Earthen dams: types, description, causes of failure and protection measures.
	1	7.2 Earthen dams: types, description, causes of failure and protection measures.
	2	7.3 Gravity dam- types, description, Causes of failure and protection measures.
	3	7.3 Gravity dam- types, description, Causes of failure and protection measures.
	4	7.4 Spillways- Types (With Sketch) and necessity.
	5	7.4 Spillways- Types (With Sketch) and necessity.

Garage drum Power  
for meet in Andhra  
A. P. Kanchan

  
14/02/2023  
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