

**GOVERNMENT POLYTECHNIC, SAMBALPUR (RENGALI)**

**LESSON PLAN OF Th-2 Hydraulics and Irrigation Engineering FOR 4TH SEM, CIVIL ENGG, SUMMER  
2024 W.E.F.16.01.2024**

Name of the Faculty: \_\_\_\_\_

Shri PRATYUSH PANDA, PTGF in Civil

Sl. No.	WEEK NO.	TOPIC	PERIODS ASSIGNED PER TOPIC	PERIODS AVAILABLE PER WEEK
1	W-1	PART: A (Hydraulics) <b>1. HYDROSTATICS:</b>	5	5
		1.1 Properties of fluid: density, specific gravity, surface tension, capillarity, viscosity and their uses		
2	W-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.	5	5
3	W-3	1.3 Pressure exerted on an immersed surface: Total pressure, resultant pressure, expression for total pressure exerted on horizontal & vertical surface.	2	5
4	W-4	<b>2. KINEMATICS OF FLUID FLOW:</b>	5	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.		
5	W-5	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) 2.3 Types of flow through the pipes: uniform and non uniform; laminar and turbulent; steady and unsteady; Reynold's number and its application	5	5
6	W-6	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). 2.5 Flow through the Open Channels: Types of channel sections- rectangular, trapezoidal and circular, discharge formulae- Chezy's and Manning's equation, Best economical section.	8	5 + 3 Extra
7	W-7	<b>3. PUMPS:</b>	5	5
		3.1 Type of pumps 3.2 Centrifugal pump: basic principles; operation, discharge, horse power & efficiency. 3.3 Reciprocating pumps: types, operation, discharge, horse power & efficiency		
8	W-8	PART: B (Irrigation Engineering) <b>1. Hydrology</b> 1.1 Hydrology Cycle 1.2 Rainfall: types, intensity, hyetograph 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> 2.1 Definition of irrigation, necessity, benefits of irrigation, types of irrigation	5	5

9	W-9	2.2 Crop season 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 <b>3. FLOW IRRIGATION</b> 3.1 Canal irrigation. types of canals. loss of water in canals	5	5
10	W-10	3.3 Different components of irrigation canals and their functions 3.4 Sketches of different canal cross-sections 3.5 Classification of canals according to their alignment, Various types of canal lining – Advantages and disadvantages <b>4. WATER LOGGING AND DRAINAGE :</b> 4.1 Causes and effects of water logging, detection, prevention and remedies	7	4
11	W-11	<b>5. DIVERSION HEAD WORKS AND REGULATORY STRUCTURES</b> 5.1 Necessity and objectives of diversion head works, weirs and barrages 5.2 General layout, functions of different parts of barrage 5.3 Silting and scouring 5.4 Functions of regulatory structures	8	5 + 3 Extra
12	W-12	<b>6. CROSS DRAINAGE WORKS</b> 6.1 Functions and necessity of Cross drainage works - aqueduct, siphon, super-passage, level crossing 6.2 Concept of each with help of neat sketch	7	5
13	W-13	<b>7. DAMS</b> 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.	8	5
13	W-14	7.4 Spillways- Types (With Sketch) and necessity.		3
13	W-15	REVISION & DISCUSSION		

Signature of Concerned Faculty  
Department of Civil Engineering

Signature  
16/07/24  
C/S of H.O.D.  
Department of Civil