

**BHUBANANANDA ODISHA SCHOOL OF ENGINEERING,
CUTTACK
DEPARTMENT OF CIVIL ENGINEERING**



LESSON PLAN

SUBJECT: HYDRAULICS & IRRIGATION ENGINEERING (TH 2)

FACULTY: MISS SONALISA SAHOO

ACCADEMIC SESSION: 2023-24(SUMMER)

SEMESTER: 4TH, SEC: A

Sd/-
HOD(CivilEngg.)

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Weeks	Semester/ Section: 4 TH / A		Name of the teaching faculty: MISS SONALISA SAHOO
	No. of Days/ per week class allotted: 05 period per week. (WED-1P, FRI & SAT- 2P)		Semester From Date: 16-01-2024 To Date: 26-04-2024 No. of weeks: 15
	Class Day	No of period available	Theory Topics
Week 1	17/01/2024	1	1 HYDROSTATICS: 1.1 Properties of fluid: density, specific gravity, viscosity.
	19/01/2024	2	1.1 surface tension, viscosity and their uses 1.2 Problems on Properties of fluid
	20/01/2024	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.
Week 2	24/01/2024	1	1.3 pressure head; pressure gauges. Problems on Pressure and its measurements.
	27/01/2024	2	1.4 Pressure exerted on an immersed surface: Total pressure, resultant pressure, expression for total pressure exerted on horizontal & vertical surface. 1.5 Problems on Pressure exerted on an immersed surface
Week 3	31/01/2024	1	PART: B (Irrigation Engineering) 1 Hydrology- 1.1 Hydrology Cycle 1.2 Rainfall: types, intensity, hyetograph.
	02/02/2024	2	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. 2 KINEMATICS OF FLUID FLOW: 2.1 Basic equation of fluid flow and their application: Rate of discharge, equation of continuity of liquid flow.

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	03/02/2024	2	2.1 total energy of a liquid in motion- potential, kinetic & pressure, Bernoulli's theorem and its limitations. Practical applications of Bernoulli's equation. Problems on 2.1
Week 4	07/02/2024	1	2.2 Flow over Notches and Weirs: Notches, Weirs, types of notches and weirs, Discharge through different types of notches and weirs- their application.
	09/02/2024	2	Problems on 2.2
	10/02/2024	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. 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.
Week5	16/02/2024	2	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.
	17/02/2024	2	Problems on 2.4
Week 6	21/02/2024	1	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.
	22/02/2024	2	Problems on 2.5
	23/02/2024	2	2 PUMPS: 3.1 Type of pumps 3.2 Centrifugal pump: basic principles, operation, discharge, horse power & efficiency. 3 Water Requirement of Crops 2.1 Definition of irrigation, necessity, benefits of irrigation, types of irrigation.
Week 7	28/02/2024	1	Class Test I
	01/03/2024	2	2.2 Crop season 2.3 Duty, Delta and base period their relationship, overlap allowance, kharif and rabi crops.

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LESSON PLAN

			2.4 Gross command area, culturable command area, Intensity of Irrigation, irrigable area, time factor, crop ratio.
	02/03/2024	2	2.4 Gross command area, culturable command area, Intensity of Irrigation, irrigable area, time factor, crop ratio. 3 FLOW IRRIGATION 3.1 Canal irrigation, types of canals, loss of water in canals.
Week 8	06/03/2024	1	3.1 Canal irrigation, types of canals, loss of water in canals.
	09/03/2024	2	3.2 Perennial irrigation. 3.3 Different components of irrigation canals and their functions
Week 9	13/03/2024	1	3.4 Sketches of different canal cross-sections.
	15/03/2024	2	3.5 Classification of canals according to their alignment, Various types of canal lining .
	16/03/2024	2	3.5 Advantages and disadvantages. QUESTION DISCUSSION
Week 10	20/03/2024	1	4 WATER LOGGING AND DRAINAGE: 4.1 Causes and effects of water logging, detection, prevention and remedies.
	22/03/2024	2	5 DIVERSION HEAD WORKS AND REGULATORY STRUCTURES 5.1 Necessity and objectives of diversion head works, weirs and barrages.
	23/03/2024	2	Class test II
Week 11	27/03/2024	1	5.2 General layout, functions of different parts of barrage.
	30/03/2024	2	5.3 Silting and scouring 5.4 Functions of regulatory structures.
Week 12	03/04/2024	1	INTERNAL ASSESSMENT
	05/04/2024	2	6 CROSS DRAINAGE WORKS: 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.
	06/04/2024	2	6.2 Concept of each with help of neat sketch. 7 DAMS 7.1 Necessity of storage reservoirs, types of dams

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Week 13	10/04/2024	1	7.2 Earthen dams: types, description, causes of failure and protection measures.
	12/04/2024	2	7.3 Gravity dam- types, description, Causes of failure and protection measures.
	13/04/2024	2	7.4 Spillways- Types (With Sketch) and necessity.
Week 14	19/04/2024	2	Revision
	20/04/2024	2	Revision
Week 15	24/04/024	1	Previous year question solving
	26/04/2024	2	Previous year question solving