

BHUBANANANDA ODISHA SCHOOL OF ENGINEERING, CUTTACK
DEPARTMENT OF CIVIL ENGINEERING



LESSON PLAN

SUBJECT: HYDRAULICS & IRRIGATION ENGINEERING (TH 2)
FACULTY: KSHITISH KUMAR SAHOO

ACCADEMIC SESSION: 2023-24(SUMMER)
SEMESTER: 4TH, SEC: B

Sd/-
H O D (Civil Engg.)

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Discipline: Civil Engineering	Semester: 4th / B		Name of the teaching faculty: KSHITISH KUMAR SAHOO
SUBJECT: HYDRAULICS & IRRIGATION ENGINEERING (TH 2)	No. of Days/ per week class allotted: 05 periods per week. (Mon-1, Tue-2, Thu-1 & Sat-1 period)		Semester From Date: 16-01-2024 To Date: 26-04-2024 No. of weeks: 15 weeks
Week	Class Day	No of period available	Theory Topics
1 ST	16/01/2024	2P	PART:A (Hydraulics) 1. HYDROSTATICS: 1.1 Properties of fluid: Density, specific gravity
	18/01/2024	1P	1.1 Properties of fluid: surface tension, Capillarity, Viscosity and their uses
	20/01/2024	1P	1.2 Pressure head and pressure gauges
2 ND	22/01/2024	1P	1.3 Pressure exerted on an immersed surface: Total pressure, resultant pressure
	25/01/2024	1P	1.3 expression for total pressure exerted on horizontal and vertical surfaces
	27/01/2024	1P	2. KINEMATICS OF FLUID FLOW: 2.1 Basic equation of fluid flow and their applications:
3 RD	29/01/2024	1P	Rate of discharge
	30/01/2024	2P	2.1 Equation of continuity of liquid flow
	01/02/2024	1P	2.1 Total energy of a liquid in motion –Potential, kinetic and pressure
	03/02/2024	1P	2.1 Bernoulli's theorem and its limitations practical application of Bernoulli's equation.

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4TH	05/02/2024	1P	2.2 Flow over notches and weirs: notches, weirs, types of notches and weirs
	06/02/2024	2P	2.2 Discharge through different types of notches and weirs –their applications.
	08/02/2024	1P	2.3 Types of flow through pipes: Uniform and non-uniform; laminar and turbulent; steady and unsteady
	10/02/2024	1P	2.3 Reynolds number and its applications
5TH	12/02/2024	1P	2.4 Losses of heads of liquid flowing through pipes: Different types of major and minor losses
	13/02/2024	2P	Simple numerical problems on losses due to friction using Darcy's equation
	15/02/2024	1P	Total energy lines and hydraulic gradient lines
	17/02/2024	1P	2.4 2.5 Flow through open channels: Types of channel cross sections- Rectangular trapezoidal and circular,
6TH	19/02/2024	1P	2.5 Discharge formula Chezy's and Manning's equation 2.5 Best economical section
	20/02/2024	2P	PART- B(Irrigation engineering) 1 HYDROLOGY 1.1 Hydrology cycle 1.2 Rainfall: Types, intensity, hyetograph
	22/02/2024	1P	1.3 Estimation of rainfall, rain gauges, its types
	24/02/2024	1P	1.4 Concept of catchment area, types, runoff, estimation of flood 1.4 discharge by Dickens and Ryve's formula

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7TH	26/02/2024	1P	2. WATER REQUIREMENT OF CROPS: 2.1 Definition of irrigation, Necessity, benefits of irrigation, types of irrigation
	27/02/2024	2P	2.2 Crop season, 2.3 Duty, delta and base period and their relationship, overlap allowances. Kharif and Rabi crops
	29/02/2024	1P	Monthly Class Test-1
	02/03/2024	1P	2.4 Gross command area, culturable command area, intensity of irrigation, Irrigable area, Time factor, crop ratio
8TH	04/03/2024	1P	3. FLOW IRRIGATION: 3.1 Canal irrigation, types of canals, loss of water in canals 3.2 Perennial irrigation
	07/03/2024	1P	3.3 Different components of irrigation canal and their functions
	09/03/2024	1P	3.4 Sketches of different canal cross sections
9TH	11/03/2024	1P	3.5 Classifications of canals according to their alignment, various types of canal lining-advantages and disadvantages
	12/03/2024	2P	4. WATER LOGGING AND DRAINAGE: 4.1 Causes and effect of Water logging, detection, prevention and remedies
	14/03/2024	1P	5. DIVERSION HEAD WORK AND REGULATORY STRUCTURE: 5.1 Necessity and objective of diversion head work, weirs and barrages
	16/03/2024	1P	5.2 General layout, function different part of barrage 5.3 Silting and scouring
10TH	18/03/2024	1P	5.4 Function of regulatory structures
	19/03/2024	2P	6. CROSS DRAINAGE WORK: 6.1 Function and necessity of Cross drainage works-aqueduct, Siphon, super

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			passage, level crossing
	21/03/2024	1P	6.2 Concept of each with help of neat sketch
	23/03/2024	1P	Questions Answers Session
11TH	28/03/2024	1P	Monthly Class Test-2
	30/03/2024	1P	7. DAMS: 7.1Necssity of storage reservoirs, types of dams
12TH	02/04/2024	2P	INTERNAL ASSESMENT
	04/04/2024	1P	7.2 Earthen dams: Types description, causes failure and protection measures,
	06/04/2024	1P	7.3 Gravity dams: Types description , causes failure and protection measures
13TH	08/04/2024	1P	7.4 Spill ways-types (with sketches) and necessity
	09/04/2024	2P	PART-A 3. PUMPS:3.1 Types of pumps, 3.2 Centrifugal pumps: Basic principles,operation
	13/04/2024	1P	3.2 Centrifugal pumps: discharge, horse power and efficiency
14TH	15/04/2024	1P	3.3Reciprocating pumps: types, operation, discharge, horse power and efficiency
	16/04/2024	2P	REVISION
	18/04/2024	1P	REVISION
	20/04/2024	1P	REVISION
15TH	22/04/2024	1P	PREVIOUS YEARS QUESTIONS DISCUSSION

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	23/04/2024	2P	PREVIOUS YEARS QUESTIONS DISCUSSION
	25/04/2024	1P	PREVIOUS YEARS QUESTIONS DISCUSSION