

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



LESSON PLAN

SUBJECT: HYDRAULICS & IRRIGATION ENGINEERING (TH 2)

FACULTY: IPSITA THAKUR

ACCADEMIC SESSION: 2022-23(SUMMER)

SEMESTER: 4TH, SEC: C

Sd/-
H O D (Civil Engg.)

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DISCIPLINE: CIVIL ENGINEERING	Semester/ Section: 4TH/ C		Name of the teaching faculty: MISS IPSITA THAKUR
Subject: HYDRAULICS & IRRIGATION ENGINEERING (TH 2)	No. of Days/ per week class allotted: 05 period per week. (Mon, Tue, Thu, Fri, & Sat – 1 period each)		Semester From Date: 10-03-2022 To Date: 10-06-2022 No. of weeks: 14
Week	Class Day	No of period available	Theory Topics
Week 1	14-02-2023	1	1 HYDROSTATICS: 1.1 Properties of fluid: density, specific gravity, viscosity.
	15-02-2023	1	1.1 surface tension, viscosity and their uses
	16-02-2023	1	Problems on Properties of fluid
	17-02-2023	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.
Week 2	20-02-2023	1	1.2 pressure head; pressure gauges.
	21-02-2023	1	Problems on Pressure and its measurements.
	22-02-2023	1	1.3 Pressure exerted on an immersed surface: Total pressure, resultant pressure, expression for total pressure exerted on horizontal & vertical surface.
	23-02-2023	1	Problems on Pressure exerted on an immersed surface
	24-02-2023	1	PART: B (Irrigation Engineering) 1 Hydrology- 1.1 Hydrology Cycle 1.2 Rainfall: types, intensity, hyetograph.
Week 3	27-02-2023	1	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.
	28-02-2023	1	2 KINEMATICS OF FLUID FLOW: 2.1 Basic equation of fluid flow and their application: Rate of discharge, equation of

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			continuity of liquid flow.
	01-03-2023	1	2.1 total energy of a liquid in motion- potential, kinetic & pressure, Bernoulli's theorem and its limitations.
	02-03-2023	1	2.1 Practical applications of Bernoulli's equation.
	03-03-2023	1	Class test 1
Week 4	06-03-2023	1	Problems on 2.1
	09-03-2023	1	Problems on 2.1
	10-03-2023	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.
Week5	13-03-2023	1	Problems on 2.2
	14-03-2023	1	Problems on 2.2
	15-03-2023	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. 2.4 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.
	16-03-2023	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.
	17-03-2023	1	Problems on 2.4
Week 6	20-03-2023	1	Problems on 2.4
	21-03-2023	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.
	22-03-2023	1	Problems on 2.5
	23-03-2023	1	3 PUMPS: 3.1 Type of pumps 3.2 Centrifugal pump: basic principles, operation, discharge, horse power & efficiency.

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	24-03-2023	1	3.3 Reciprocating pumps: types, operation, discharge, horse power & efficiency.
Week 7	27-03-2023	1	2 Water Requirement of Crops 2.1 Definition of irrigation, necessity, benefits of irrigation, types of irrigation.
	28-03-2023	1	2.2 Crop season 2.3 Duty, Delta and base period their relationship, overlap allowance, kharif and rabi crops.
	29-03-2023	1	2.4 Gross command area, culturable command area, Intensity of Irrigation, irrigable area, time factor, crop ratio.
	31-03-2023	1	Class test 2
Week 8	03-04-2023	1	3 FLOW IRRIGATION 3.1 Canal irrigation, types of canals, loss of water in canals.
	04-04-2023	1	3.1 Canal irrigation, types of canals, loss of water in canals.
	05-04-2023	1	3.2 Perennial irrigation.
	06-04-2023	1	3.3 Different components of irrigation canals and their functions
Week 9	10-04-2023	1	3.4 Sketches of different canal cross-sections.
	11-04-2023	1	3.5 Classification of canals according to their alignment, Various types of canal lining .
	12-04-2023	1	3.5 Classification of canals according to their alignment, Various types of canal lining .
	13-04-2023	1	QUESTION DISCUSSION
Week 10	17-04-2023	1	3.5 Advantages and disadvantages.
	18-04-2023	1	4 WATER LOGGING AND DRAINAGE: 4.1 Causes and effects of water logging, detection, prevention and remedies.
	19-04-2023	1	5 DIVERSION HEAD WORKS AND REGULATORY STRUCTURES 5.1 Necessity and objectives of diversion head works, weirs and barrages.
	20-04-2023	1	5.1 Necessity and objectives of diversion head works, weirs and barrages.
	21-04-2023	1	5.2 General layout, functions of different parts of barrage.
Week 11	24-04-2023	1	5.2 General layout, functions of different parts of barrage.
	25-04-2023	1	5.3 Silting and scouring

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	26-04-2023	1	5.3 Silting and scouring
	27-04-2023	1	5.4 Functions of regulatory structures.
	28-04-2023	1	INTERNAL ASSESSMENT
Week 12	01-05-2023	1	6 CROSS DRAINAGE WORKS: 6.1 Functions and necessity of Cross drainage works - aqueduct, siphon, super passage, level crossing.
	02-05-2023	1	6.2 Concept of each with help of neat sketch.
	03-05-2023	1	6.2 Concept of each with help of neat sketch.
	04-05-2023	1	7 DAMS 7.1 Necessity of storage reservoirs, types of dams
Week 13	08-05-2023	1	7.2 Earthen dams: types, description, causes of failure and protection measures.
	09-05-2023	1	7.2 Earthen dams: types, description, causes of failure and protection measures.
	10-05-2023	1	7.3 Gravity dam- types, description, Causes of failure and protection measures.
	11-05-2023	1	7.4 Spillways- Types (With Sketch) and necessity.
	12-05-2023	1	Class test 3
Week 14	15-05-2023	1	Revision
	06-05-2023	1	Revision
	17-05-2023	1	Revision
	18-05-2023	1	Previous year question solving
Week 15	22-05-2023	1	Previous year question solving