LESSON PLAN
DEPARTMENT OF CIVIL ENGINEERING
GANAPATI INSTITUTE OF ENGINEERING AND TECHNOLOGY, JAGATPUR, CUTTACK
SUBJECT: HYDRAULICS & IRRIGATION ENGINEERING. Periods: 5 per week **SEMESTER:** 4th

NAME OF FACULTY: Swagatika Samal

Semester From date: 13.02.2023 **To Date:** 23.05.2023 **No. of weeks:** 15

Week	Class Day	Theory / Practical Topics
1st	1st	Introduction on Hydraulics and Irrigation Engg.
	2nd	Properties of fluid: density, specific gravity, surface tension,
	3rd	capillarity, viscosity and their uses
	4th	Pressure and its measurements: intensity of pressure, atmospheric pressure,
	5th	gauge pressure, absolute pressure and vacuum pressure;
2nd	1st	relationship between atmospheric pressure, absolute pressure and gauge pressure;
	2nd	relationship between atmospheric pressure, absolute pressure and gauge pressure;
	3rd	relationship between pressure head; pressure gauges
	4th	Pressure exerted on an immersed surface: Total pressure, resultant pressure,
	5th	expression for total pressure exerted on horizontal
3rd	1st	expression for total pressure exerted on vertical surface
	2nd	Numerical
	3rd	Introduction on Kinematics of fluid flow:
	4th	Basic equation of fluid flow and their application: Rate of discharge, equation of continuity of liquid flow,
	5th	total energy of a liquid in motion- potential, kinetic & pressure,
4th	1st	Bernoulli's theorem and its limitations..
	2nd	Practical applications of Bernoulli's equation
	3rd	Flow over Notches and Weirs: Notches, Weirs,
	4th	types of notches and weirs,
	5th	Discharge through different types of notches and weirs-their application (No Derivation)
5th	1st	Types of flow through the pipes: uniform and non uniform
	2nd	laminar and turbulent; steady and unsteady;
	3rd	Reynold's number and its application
	4th	Losses of head of a liquid flowing through pipes: Different types of major and minor losses.
	5th	Simple numerical problems on losses due to friction using Darcy's equation,
6th	1st	Simple numerical problems on losses due to friction using Darcy's equation,
	2nd	Simple numerical problems on Total energy lines & hydraulic gradient lines (Concept Only).
	3rd	Flow through the Open Channels: Types of channel sections-rectangular,
	4th	trapezoidal and circular, discharge formulae- Chezy's and Manning's equation, Best economical section.
	5th	trapezoidal and circular, discharge formulae- Chezy's and Manning's equation, Best economical section.
7th	1st	Type of pumps
	2nd	Centrifugal pump: basic principles, operation,.
	3rd	discharge, horse power & efficiency
	4th	Reciprocating pumps: types, operation,
	5th	discharge, horse power & efficiency
8th	1st	Hydrology Cycle
	2nd	Rainfall: types, intensity, hyetograph

	3rd	Estimation of rainfall, rain gauges, Its types(concept only),
	4th	Concept of catchment area, types, run-off, estimation of flood discharge by Dicken's and Ryve's formulae
	5th	Water Requirement of Crops: Definition of irrigation, necessity, benefits of irrigation, types of irrigation
9th	1st	Crop season
	2nd	Duty, Delta and base period their relationship, overlap allowance, kharif and rabi crops
	3rd	Gross command area, culturable command area, Intensity of Irrigation, irrigable area, time factor, crop ratio
	4th	flow irrigation: Canal irrigation, types of canals, loss of water in canals
	5th	Perennial irrigation
10th	1st	Different components of irrigation canals and their functions
	2nd	Sketches of different canal cross-sections
	3rd	Classification of canals according to their alignment
	4th	Various types of canal lining – Advantages and disadvantages
	5th	Various types of canal lining – Advantages and disadvantages
11th	1st	Water logging and drainage : Causes and effects of water logging
	2nd	detection, prevention and remedies
	3rd	Introduction on diversion head works and regulatory structures
	4th	Necessity and objectives of diversion head works,
	5th	weirs and barrages
12th	1st	weirs and barrages
	2nd	General layout of barrage
	3rd	functions of different parts of barrage
	4th	Silting and scouring Functions of regulatory structures
	5th	Silting and scouring Functions of regulatory structures
13th	1st	Introduction on cross drainage works
	2nd	Functions and necessity of Cross drainage works -
	3rd	aqueduct, siphon,
	4th	aqueduct, siphon,
	5th	super- passage, level crossing
14th	1st	Concept of each with help of neat sketch
	2nd	Concept of each with help of neat sketch
	3rd	Introduction of Dams
	4th	Necessity of storage reservoirs,
	5th	types of dams
15th	1st	Earthen dams: types, description,.
	2nd	causes of failure and protection measures
	3rd	Gravity dam- types, description,
	4th	Causes of failure and protection measures.
	5th	Spillways- Types (With Sketch) and necessity