

**DEPARTMENT OF CIVIL ENGINEERING  
GANAPATI INSTITUTE OF ENGINEERING AND TECHNOLOGY,  
JAGATPUR, CUTTACK**

DISCIPLINE- CIVIL ENGG.	SEMESTER-4 <sup>TH</sup>	NAME OF THE TEACHING FACULTY- SWAGATIKA SAMAL
SUBJECT- H&IE(Th.2)	NO. OF DAYS PER WEEK CLASS ALLOTTED-03/05	SEMESTER FROM DATE-16/01/24 TO DATE-26/04/24 NO. OF WEEKS-15
WEEK	CLASS DAY	THEORY TOPICS
1 <sup>ST</sup>	1 <sup>ST</sup>	1.1 <b>Properties of fluid:</b> density, specific gravity, surface tension, capillarity, viscosity and their uses
2 <sup>ND</sup>	1 <sup>ST</sup>	1.2 <b>Pressure and its measurements:</b> intensity of pressure, atmospheric pressure, gauge pressure, absolute pressure and vacuum pressure;
	2 <sup>ND</sup>	1.2 relationship between atmospheric pressure, absolute pressure and gauge pressure; pressure head; pressure gauges.
	3 <sup>RD</sup>	1.2 relationship between atmospheric pressure, absolute pressure and gauge pressure; pressure head; pressure gauges.
3 <sup>RD</sup>	1 <sup>ST</sup>	1.3 <b>Pressure exerted on an immersed surface:</b> Total pressure, resultant pressure, expression for total pressure exerted on horizontal & vertical surface.
	2 <sup>ND</sup>	2.1 <b>Basic equation of fluid flow and their application:</b> Rate of discharge, equation of continuity of liquid flow.
	3 <sup>RD</sup>	2.1 total energy of a liquid in motion- potential, kinetic & pressure, Bernoulli's theorem and its limitations. Practical applications of Bernoulli's equation
4 <sup>TH</sup>	1 <sup>ST</sup>	2.2 <b>Flow over Notches and Weirs:</b> Notches, Weirs, types of notches and weirs,
	2 <sup>ND</sup>	2.2 Discharge through different types of notches and weirs-their application (No Derivation)
	3 <sup>RD</sup>	2.3 <b>Types of flow through the pipes:</b> uniform and non uniform; laminar and turbulent; steady and unsteady; Reynold's number and its application
5 <sup>TH</sup>	1 <sup>ST</sup>	2.4 <b>Losses of head of a liquid flowing through pipes:</b> Different types of major and minor losses. Simple numerical problems on losses due to friction using Darcy's equation,
	2 <sup>ND</sup>	2.4 Total energy lines & hydraulic gradient lines (Concept Only).
	3 <sup>RD</sup>	2.5 <b>Flow through the Open Channels:</b> Types of channel sections- rectangular, trapezoidal and circular, discharge formulae- Chezy's and Manning's equation, Best economical section.
6 <sup>TH</sup>	1 <sup>ST</sup>	3.1 <b>Type of pumps</b>
	2 <sup>ND</sup>	3.2 <b>Centrifugal pump:</b> basic principles, operation, discharge, horse power & efficiency.
	3 <sup>RD</sup>	3.3 <b>Reciprocating pumps:</b> types, operation, discharge, horse power & efficiency
7 <sup>TH</sup>	1 <sup>ST</sup>	1.1 Hydrology Cycle 1.2 Rainfall: types, intensity, hyetograph 1.3 Estimation of rainfall, rain gauges, Its types(concept only).
	2 <sup>ND</sup>	1.4 Concept of catchment area, types, run-off, estimation of flood discharge by Dicken's and Ryve's formulae
	3 <sup>RD</sup>	2.1 Definition of irrigation, necessity, benefits of irrigation, types of irrigation 2.2 Crop season
8 <sup>TH</sup>	1 <sup>ST</sup>	2.3 Duty, Delta and base period their relationship, overlap allowance, kharif and rabi crops
	2 <sup>ND</sup>	2.4 Gross command area, culturable command area, Intensity of

		Irrigation, irrigable area, time factor, crop ratio
	3 <sup>rd</sup>	3.1 Canal irrigation, types of canals, loss of water in canals 3.2 Perennial irrigation 3.3 Different components of irrigation canals and their functions
9 <sup>TH</sup>	1 <sup>st</sup>	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
	2 <sup>nd</sup>	4.1 Causes and effects of water logging, detection, prevention and remedies
	3 <sup>rd</sup>	5.1 Necessity and objectives of diversion head works, weirs and barrages 5.2 General layout, functions of different parts of barrage
10 <sup>TH</sup>	1 <sup>st</sup>	5.3 Silting and scouring 5.4 Functions of regulatory structures
	2 <sup>nd</sup>	6.3 Concept of transiting –Measurement of horizontal and vertical angles.
	3 <sup>rd</sup>	6.1 Functions and necessity of Cross drainage works - aqueduct, siphon, super-passage, level crossing
11 <sup>TH</sup>	1 <sup>st</sup>	6.1 Functions and necessity of Cross drainage works - aqueduct, siphon, super-passage, level crossing
	2 <sup>nd</sup>	6.1 Functions and necessity of Cross drainage works - aqueduct, siphon, super-passage, level crossing
	3 <sup>rd</sup>	6.1 Functions and necessity of Cross drainage works - aqueduct, siphon, super-passage, level crossing
12 <sup>TH</sup>	1 <sup>st</sup>	6.1 Functions and necessity of Cross drainage works - aqueduct, siphon, super-passage, level crossing
	2 <sup>nd</sup>	6.2 Concept of each with help of neat sketch
	3 <sup>rd</sup>	6.2 Concept of each with help of neat sketch
13 <sup>TH</sup>	1 <sup>st</sup>	6.2 Concept of each with help of neat sketch
	2 <sup>nd</sup>	6.2 Concept of each with help of neat sketch
	3 <sup>rd</sup>	7.1 Necessity of storage reservoirs, types of dams 7.2 Earthen dams: types, description, causes of failure and protection measures.
14 <sup>TH</sup>	1 <sup>st</sup>	7.1 Necessity of storage reservoirs, types of dams 7.2 Earthen dams: types, description, causes of failure and protection measures.
	2 <sup>nd</sup>	7.3 Gravity dam- types, description, Causes of failure and protection measures
	3 <sup>rd</sup>	7.3 Gravity dam- types, description, Causes of failure and protection measures
15 <sup>TH</sup>	1 <sup>ST</sup>	7.4 Spillways- Types (With Sketch) and necessity
	2 <sup>ND</sup>	7.4 Spillways- Types (With Sketch) and necessity
	3 <sup>RD</sup>	7.4 Spillways- Types (With Sketch) and necessity

S. Samal  
13.01.24  
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