

# Theory - 02

## LESSON PLAN

Discipline: Civil Engg. ,UGMIT Rayagada  
Semester: ~~6<sup>TH</sup>~~ 4<sup>th</sup>  
Name of the Teaching Faculty:  
Subject: Hydraulics and Irrigation Engineering (Th-2)  
No of Days/week class allotted: 05  
Session: 2019-20

Week	Class Day	Theory/Practical Topics	Remarks
1	1-5	<b>HYDROSTATICS:</b> 1.1 <b>Properties of fluid:</b> density, specific gravity, surface tension, capillarity, viscosity and their uses (2)  1.2 <b>Pressure and its measurements:</b> intensity of pressure, atmospheric pressure, gauge pressure, absolute pressure and vacuum pressure; (3)	
2	6-10	1.2 relationship between atmospheric pressure, absolute pressure and gauge pressure; pressure head; pressure gauges.(2)  1.3 <b>Pressure exerted on an immersed surface:</b> Total pressure, resultant pressure, (3)	
3	11-15	1.3 expression for total pressure exerted on horizontal & vertical surface. (2) <b>KINEMATICS OF FLUID FLOW:</b> 2.1 <b>Basic equation of fluid flow and their application:</b> Rate of discharge, equation of continuity of liquid flow (3)	
4	16-20	2.1 total energy of a liquid in motion- potential, kinetic & pressure, Bernoulli's theorem and its limitations. Practical applications of Bernoulli's equation.(3)  2.2 <b>Flow over Notches and Weirs:</b> Notches, Weirs, types of notches and weirs, (2)	
5	21-25	Discharge through different types of notches and weirs-their	

		<p>application (No Derivation) (1)</p> <p><b>2.3 Types of flow through the pipes:</b> uniform and non uniform; laminar and turbulent; steady and unsteady; Reynold's number and its application (3)</p> <p><b>2.4 Losses of head of a liquid flowing through pipes:</b> Different types of major and minor losses. (1)</p>	
6	26-30	<p>2.4 Simple numerical problems on losses due to friction using Darcy's equation, Total energy lines &amp; hydraulic gradient lines (Concept Only). (2)</p> <p><b>2.5 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.(3)</p>	
7	31-35	<p><b>PUMPS:</b></p> <p><b>3.1 Type of pumps</b></p> <p><b>3.2 Centrifugal pump:</b> basic principles, operation, discharge, horse power &amp; efficiency.</p> <p><b>3.3 Reciprocating pumps:</b> types, operation, discharge, horse power &amp; efficiency</p>	
8	36-40	<p><b>Hydrology</b></p> <p>1.1 Hydrology Cycle</p> <p>1.2 Rainfall: types, intensity, hyetograph</p> <p>1.3 Estimation of rainfall, rain gauges, Its types(concept only),</p> <p>1.4 Concept of catchment area, types, run-off, estimation of flood discharge by Dicken's and Ryve's formulae (4)</p> <p><b>Water Requirement of Crops</b></p> <p>2.1 Definition of irrigation, necessity, benefits of irrigation, types of irrigation (1)</p>	
9	41-45	<p>2.2 Crop season</p> <p>2.3 Duty, Delta and base period their relationship, overlap allowance, kharif and rabi crops</p> <p>2.4 Gross command area, culturable command area, Intensity of Irrigation, irrigable area, time factor, crop ratio (3)</p> <p><b>FLOW IRRIGATION</b></p> <p>3.1 Canal irrigation, types of canals, loss of water in canals (2)</p>	
10	46-50	<p>3.2 Perennial irrigation</p> <p>3.3 Different components of irrigation canals and their functions</p>	

		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	
11	51-55	<b>WATER LOGGING AND DRAINAGE :</b> 4.1 Causes and effects of water logging, detection, prevention and remedies (2) <b>DIVERSION HEAD WORKS AND REGULATORY STRUCTURES</b> 5.1 Necessity and objectives of diversion head works, weirs and barrages (3)	
12	56-60	5.2 General layout, functions of different parts of barrage 5.3 Silting and scouring 5.4 Functions of regulatory structures	
13	61-65	<b>CROSS DRAINAGE WORKS :</b> 6.1 Functions and necessity of Cross drainage works - aqueduct, siphon, super-passage, level crossing	
14	66-70	6.2 Concept of each with help of neat sketch (2) <b>DAMS</b> 7.1 Necessity of storage reservoirs, types of dams (3)	
15	71-75	7.2 Earthen dams: types, description, causes of failure and protection measures. 7.3 Gravity dam- types, description, Causes of failure and protection measures. 7.4 Spillways- Types (With Sketch) and necessity.	

Signature of Faculty:

Signature of HOD: