

# शासकीय पॉलिटेक्निक गरियाबंद



Subject : HYDRAULICS

Semester : 3<sup>rd</sup>

Session : JULY - DEC 2024

Faculty : NAGENDRA PATEL

Phone - 07706-299303

Email- gpolyg@rediffmail.com

Website - www.polygariyaband.ac.in

**GOVERNMENT POLYTECHNIC GARIYABAND**  
**DEPARTMENT OF CIVIL ENGINEERING**  
**LESSON PLAN**

Session:- July-Dec 2024

Session start date as per University Calendar:

Subject Name:- **HYDRAULICS**

Name of Subject teacher:- Nagendra patel

Course Code:- 2020375(020)

Lecture plus Tutorial/Week:- 03

Lecture No.	No. & Name of chapter	Topic/Subtopics to be covered under this unit	No. of period planned	Planned Date	Execution date	Remarks	
01	<b>UNIT-01</b> <b>Introduction</b>	Definition of liquid, Ideal liquid and Real liquid Properties of liquid - Mass density, Specific weight, Specific Gravity, Compressibility, Viscosity, Surface Tension, Capillarity	01	03/09/24	13/09/24		
02		Branches of hydraulics- Hydro Statics, Hydro Kinematics and Hydro Dynamics	01	05/09/24	13/09/24		
03		Pressure, Pressure intensity, Variation of pressure with depth of liquid, Pressure head	01	10/09/24	17/09/24		
04		Effect of shape and size of container on pressure, PASCAL's law.	01	12/09/24	19/09/24		
05		Atmospheric Pressure, Gauge Pressure, Absolute Pressure, Vacuum Pressure.	01	13/09/24	20/09/24		
06		Measurement of pressures by different methods -- Piezometer, Manometer	01	13/09/24	20/09/24		
07-08		Differential Manometer and Inverted Differential Manometer	02	14/09/24	21/09/24		
09		U-tube pressure gauge	01	17/09/24	24/09/24		
10		Total pressure and centre of pressure and pressure distribution diagram	01	19/09/24	26/09/24		
11-12		Computation of Total pressure and centre of pressure on plane horizontal surface, vertical surface and inclined surface	02	20/09/24	30/09/24 01/10/24		
11		Types of liquid flow Laminar, Turbulent, Uniform-Non uniform	01	21/09/24	03/10/24		
12		Steady, Unsteady, and Compressible, Incompressible flow, Rate of flow	01	24/09/24	04/10/24		
13		Law of conservation of mass, Continuity Equation	01	26/09/24	04/10/24		
14		Stream line, Path line, Streak line	01	27/09/24	05/10/24		
15-16		Numerical problems	02	28/09/24	05/10/24		
17		<b>UNIT-02</b>	Various forms of energies present in liquid flow - potential energy	01	01/10/24	15/10/24	

18	Hydro kinematics, Hydro dynamics	total energy, potential head, kinetic head, pressure head, totalhead	01	03/10/24	17/10/24
19		Bernoulli's Equation and Limitations of Bernoulli's theorem	01	04/10/24	18/10/24
20-21		Simple Application of Equation of Continuity and Bernoulli's theorem	02	04/10/24 05/10/24	18/10/24
22		Pitot tube & problems	01	05/10/24	22/10/24
23	Unit-03  Flow measurement Venturimeter, Orifice meter, Flow through orifice & notches	Components of venturimeter discharge through venturimeter	01	8/10/24	22/10/24
24		Numerical problems	01	15/10/24	5/11/24
25		Discharge through orifice meter	01	17/10/24	8/11/24
26		Definition and types of orifice Vena Contracta	01	18/10/24	8/11/24
27		Various Hydraulic Coefficients $C_v$ and $C_d$ and relationship between them	01	18/10/24	9/11/24
28		Time required for emptying tank through orifice at the bottom of tank	01	19/10/24	14/11/24
29		Definition and Description Computation of discharge through notches - Rectangular Notch	01	19/10/24	16/11/24
30-31		V-Notch and Trapezoidal Notch	02	22/10/24 24/10/24	16/11/24
32		Definition and Description Computation of discharge through weirs- Discharge through narrow crested	01	25/10/24	19/11/24
33		broad Crested weir (No Derivation), Discharge through Cipolletti weir	01	25/10/24	21/11/24
34-35	Numerical problems	02	26/10/24	26/11/24	
36	Unit-04  Flow through Pipes	Characteristics of flow through pipes	01	5/11/24	28/11/24
37-38		Major Energy (Head) losses in pipe Flow- Expression for head loss in pipes due to friction and Computation of major head by Darcy Weisbach Equation	02	8/11/24	29/11/24
39		Numerical problems	01	9/11/24	30/11/24
40-41		Minor Energy (Head) losses in pipe Flow loss of head at Sudden enlargement, contraction, entry, exit and at bend	02	9/11/24 12/11/24	3/12/24
42		Numerical problems	01	14/11/24	5/12/24
43		Hydraulic Gradient Line (HGL) and Total Energy Line (TEL) in various cases	01	16/11/24	6/12/24
44		Flow of water from one tank to another by long pipe	01	16/11/24	6/12/24
45		Flow through pipes in series and parallel	01	19/11/24	10/12/24
46		Numerical problems	01	21/11/24	12/12/24
47		Unit-05	Open channel flow Comparison of pipe flow and open channel flow	01	22/11/24
48-49	Wetted perimeter, Hydraulic mean depth, Hydraulic gradient		02	22/11/24 23/11/24	13/12/24 14/12/24
50-51	Froude number, uniform and non uniform flow		01	23/11/24	14/12/24

52	Flow through Open Channel & Pumps	Use of Chezy's and Manning's formulae	01	26/11/24	17/12/24	
53-54		Most economical sections of channel Rectangular, Trapezoidal	02	28/11/24 25/11/24	19/12/24	
55		Specific Energy Diagram, Critical Depth	01	29/11/24	20/12/24	
56		Critical Velocity, Streaming Flow, Critical Flow	01	30/11/24	20/12/24	
57		Shooting Flow, Hydraulic Jump	01	30/11/24	21/12/24	
58		Definition, description of Centrifugal pump, Reciprocating pump and Submersible Pump	01	3/12/24	24/12/24	
59-60		Components and working principles of centrifugal pump and Reciprocating pump Priming, Selection criteria for pumps.	02	5/12/24	30/12/24	
				6/12/24	31/12/24	
Total			48			

*M. Patel*

Signature of teacher

HOD

**Detailed Teaching**

Topics to be covered	
Unit No.	
Lecture No.	