

GANPAT UNIVERSITY

FACULTY OF ENGINEERING & TECHNOLOGY

Programme	Bachelor of Technology			Branch/Spec.	Civil Engineering				
Semester	III			Version	2.0.0.1				
Effective from Academic Year		2026-27		Effective for the Batch admitted in			July 2025		
Course Code	2CI3108		Course Name		Fluid Mechanics				
Teaching Scheme					Examination Scheme (Marks)				
(Per week)	Lecture (DT)		Practical (Lab.)		Total		CE	SEE	Total
	L	TU	P	TW					
Credit	03	00	01	00	04	Theory	40	60	100
Hours	03	00	02	00	05	Practical	30	20	50
Pre-requisites									

Course Outcomes									
On successful completion of the course, the students will be able to:									
CO1	Understand the fundamentals of fluid mechanics including fluid, flow properties and forces prevailing.								
CO2	Analyze the motion of the fluid using mathematical equations on hydraulic structures.								
CO3	Classify and learn to create the models for hydraulic structures and conditions.								
CO4	Apply the concepts and knowledge to real life problems in pipes and open channel flow.								
CO5	Evaluate the measurement of various structures like notches, weirs, orifices and mouthpieces.								
Theory Syllabus									
Unit	Content								Hrs.
1	Introduction to Fluid Mechanics Definition and classification, types of fluid and its properties, Newton's law of viscosity, surface tension and capillarity.								4
2	Fluid Statics Definition, types of pressure and pressure measuring instruments, Buoyancy, Meta Centre and determination of Metacentric height. Condition of equilibrium of floating and submerged body.								6
3	Fluid Kinematics and Dynamics Introduction, types of fluid flow and flow lines, velocity potential and stream function, flow, Euler's and Bernoulli's equation of motion, continuity equation in Cartesian coordinate system, Practical application of Bernoulli's Equation.								7
4	Types of Flow Introduction to laminar and turbulent flow, Reynolds's experiment, Flow of viscous fluid through circular pipe and two parallel plates, Darcy-Weisbach equation for head loss, Shear stress in turbulent flow, Prandtl's mixing length theory, Introduction of boundary layer flow and characteristics, methods for separation of boundary layer and control, Hydrodynamically smooth and rough pipes.								9
5	Dimensional and Model Analysis Concept of dimensions and dimensional homogeneity, dimensionless parameters, methods of dimensional analysis, model analysis, types of similarities, types of forces acting on moving fluid, model laws, classification of model.								5
6	Pipes and Open Channel Flow Introduction, Types of loss of energy in pipe, hydraulic gradient, total energy line, flow through series, parallel and branched pipes, types of flow in channel, velocity and discharge computation, most economical section design and analysis, specific energy its curve, critical flow, gradually varied flow, hydraulic jump and its application.								9
7	Measurement of flow Orifice & Mouth piece Definitions and classification, hydraulic coefficients, discharge through orifices & mouthpieces. Notches and Weirs Definitions and classification, discharge through various types of notches and weirs.								5

Term work shall be based on the above mentioned course content.

Text Books

1	A Textbook of Fluid Mechanics, Er. R K. Rajput
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Reference Books

1	Dr.R.K.Bansal ,Fluid mechanics & Hydraulic Machines
2	Dr.D.S.Kumar ,Fluid mechanics
3	Dr.A.K.Jain ,Fluid mechanics
4	Dr.P.N.Modi & Sheth ,Fluid mechanics & Hydraulic Machines
5	S.Ramamurthan ,Hydraulic Fluid mechanics & Fluid Machines
6	R.J.Garde & A.C.Mirajgaoker ,Engineering Fluid Mechanic

ICT/MOOCs Reference

1	http://nptel.iitm.ac.in/courses/Webcourse-contents/IIT-%20Guwahati/fluid_mechanics/index.htm
2	http://nptel.iitm.ac.in/video.php?subjectId=105101082
3	http://www.mvsengineering.com
4	http://nptel.iitm.ac.in/courses/IIT-MADRAS/Hydraulics/index.php
5	http://nptel.iitm.ac.in/video.php?subjectId=105103096

Mapping of CO with PO and PSO:

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	1	0	1	0	0	0	0	0	0	0	1	1	2	0
CO2	2	3	3	2	0	0	0	0	0	0	0	0	1	3	0
CO3	3	1	3	2	3	0	0	0	2	1	0	1	3	1	0
CO4	2	3	3	3	0	3	1	1	2	1	2	3	2	3	1
CO5	2	3	1	3	1	3	1	1	3	3	2	3	3	1	0