



National Institute of Technology Meghalaya
An Institute of National Importance

CURRICULUM

Programme	Bachelor of Technology in Mechanical Engineering	Year of Regulation	2018
Department	Mechanical Engineering	Semester	III

Course Code	Course Name	Credit Structure				Marks Distribution	
		L	T	P	C	Continuous Evaluation	Total
ME 255	Fluid Mechanics Laboratory	0	1	2	2	100	100
Course Objectives	To develop students' ability to measure various pressure heads and visualize different types of flow.	Course Outcomes	CO1	Explain flow regimes, floating and submerged bodies, Bernoulli's theorem, pipe friction and flow measuring devices (Understand)			
	To develop students' ability to understand characteristics of floating bodies and frictional losses in pipes.		CO2	Experiment with Reynolds apparatus, Bernoulli's apparatus, stability apparatus, flow visualization apparatus and pipe friction apparatus to estimate Reynolds number, demonstrate Bernoulli's principle, demonstrate stability of the floating bodies, visualize flow past immersed bodies and estimate frictional coefficient. (apply)			
	To develop students ability to measure flow rate using flow measuring devices.		CO3	Experiment with venturi, nozzle and orifice meters to estimate discharge coefficient. (Apply)			
			CO4	Apply the knowledge of fluid mechanics to make a project that is innovative or have applications of fluid mechanics concepts (Apply)			

No.	COs	Mapping with Program Outcomes (POs)												Mapping with PSOs		
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	CO1	2	0	0	0	0	0	0	0	0	0	0	0	2	1	0
2	CO2	2	0	0	0	0	0	0	0	0	0	0	0	2	1	0
3	CO3	2	0	0	0	0	0	0	0	0	0	0	0	2	1	0
4	CO4	2	2	2	0	0	0	0	0	0	0	0	0	2	1	0

SYLLABUS

No.	Content	Hours	COs
I	Introduction Fundamentals of Flow visualization, flow measuring devices, Bernoulli's principle, stability of floating bodies and frictional losses in pipes	03	CO1
II	Flow Visualization Laminar, Transition, Turbulent flow visualization & finding the critical Reynolds Number	03	CO1 CO2
III	Verify Bernoulli's principle Verification of the Bernoulli's Principle, Recording pressure and velocity curves in a Venturi nozzle, Determination of flow coefficient at different flow rate, Friction effects recognition.	03	CO1 CO2
IV	Stability of floating bodies Study the Stability of floating bodies & finding the metacentre, determination of buoyancy.	03	CO1 CO2
V	Flow Measuring devices Measurement of flow rates with Venturi, Nozzle, Orifice meter and determination of corresponding flow rate coefficients, Calibration of the flow measuring devices.	03	CO1 CO3
VI	Friction losses in pipes Determination of the losses in pipe due to different pipe diameter, different material and different surface roughness and different flow rate.	03	CO1 CO2
VII	Flow Visualization past bluff bodies Flow Visualization of Streamlines Past Bluff Body with the Help of an Aerodynamic Trainer	03	CO2
VIII	Mini Project Mini Project on Creating Models/Experimental Setups for Demonstrating Applications of Fluid Mechanics	09	CO4
Total Hours		30	

Essential Readings

1. Introduction to Fluid Mechanics and Fluid Machines, Som, Biswas and Chakraborty, TMH, 3rd edition, 2011

Supplementary Readings

1. Fluid Mechanics, Frank White, TMH, 8th edition, 2015

2. Fluid Mechanics, Streeter, Wylie and Bedford, TMH, 9th edition, 2010

3. Mechanics of Fluids, Massey, ELBS, 9th edition, 2011

4. Introduction to Fluid Mechanics, Fox, Pritchard, and McDonald, Wiley India edition, 2018