



National Institute of Technology Meghalaya
An Institute of National Importance

CURRICULUM

Programme	Master of Technology in Mechanical Engineering	Year of Regulation	2018
Department	Mechanical Engineering	Semester	I

Course Code	Course Name	Credit Structure				Marks Distribution		
		L	T	P	C	Continuous Evaluation	Viva and Quiz	Total
ME551	Advanced Fluid Mechanics Lab	0	0	2	1	70	30	200
Course Objectives	To introduce to the concept of Reynolds number and its use to classify flows	Course Outcomes	CO1	Able to calculate Reynolds number and classify fluid flows (Understanding)				
	To introduce to the Bernoulli's principle and Stability of floating bodies		CO2	Able to explain Bernoulli's principle and Stability of floating bodies exact solutions for various approximations of Navier Stokes equations (Analyzing).				
	To introduce to flow measurement devices and their principle of operation		CO3	Able to determine coefficient of discharge for various flow measurement devices (Analysing)				
	To introduce to the aerodynamic trainer and drag calculation		CO4	Able to demonstrate boundary layer flows and calculate drag forces on bodies (Applying and Analysing).				
			CO5	Able to determine viscosity and show its dependence on temperature				

SYLLABUS

No.	List of Experiments	Hours	COs
I	Determination of critical Reynolds number through visualization of laminar, transition and turbulent flow	03	CO1
II	Verification of Bernoulli's principle through recording of pressure and velocity curves in the venturi meter	03	CO1
III	Determination of stability of floating bodies	03	CO2
IV	Determination of coefficient of discharge for venturi, nozzle and orifice meter	03	CO2
V	Analysis of boundary layer flow on a flat plate to determine the drag and demonstrate Coanda effect	03	CO3
VI	Visualization of flow separation and vortex formation to demonstrate von Karman vortices	03	CO4
VII	Visualization and measurement of drag around bodies in potential flow	03	CO5
VIII	Determination of viscosity and its dependence on temperature	03	CO5
Total Hours		24	

References

- Y. A. Cengel and J. M. Cimbala, "Essential of Fluid Mechanics – Fundamentals and Applications", McGraw Hill Education, 2006
- K. Muralidhar and G. Biswas, "Advanced Engineering Fluid Mechanics", Alpha Science, 2001.
- W. P. Graebel, "Advanced Fluid Mechanics", Academic Press, 2007.

Supplementary Readings

- F. M. White, "Fluid Mechanics", TMH, 1998.
- S. K. Som, G. Biswas and S. Chakraborty, "Introduction to Fluid Mechanics and Fluid Machines", TMH, 2017