



GOKARAJU RANGARAJU INSTITUTE OF ENGINEERING AND TECHNOLOGY

FLUID MECHANICS AND HYDRAULIC MACHINERY LAB

Course Code: GR15A2033
II Year II Semester

L:0 T:0 P:2 C:2

Prerequisites: Fundamentals of Fluid Mechanics and Hydraulic Machinery

Course Objectives

- To provide practical knowledge in verification of principles of fluid flow
- To impart knowledge in measuring pressure, discharge and velocity of fluid flow
- To understand Major and Minor Losses
- To gain knowledge in performance testing of Hydraulic Turbines and Hydraulic Pumps at constant speed and Head

Course Outcomes

- To provide the students with a solid foundation in fluid flow principles
- To provide the students knowledge in calculating performance analysis in turbines and pumps and can be used in power plants
- Students can able to understand to analyze practical problems in all power plants and chemical industries
- Conduct experiments (in teams) in pipe flows and open-channel flows and interpreting data from model studies to prototype cases, as well as documenting them in engineering reports
- Analyze a variety of practical fluid-flow devices and utilize fluid mechanics principles in design
- Given the required flow rate and pressure rise, select the proper pump to optimize the pumping efficiency
- To provide exposure to modern computational techniques in fluid dynamics

List of Experiments

1. Verification of Bernoulli's theorem and draw the HGL, TEL
2. Determine the Coefficient discharge of Venturi meter and Orifice meter
3. Determine the Darcy's Friction factor in various diameters of pipes
4. Determine the Minor Losses (Different Valve connections, Sudden Expansion, Sudden Contraction, Bends, joints) in various pipe fittings
5. Determine the coefficient of impact of Jet on given Vanes
6. Determine the overall efficiency of Pelton wheel Turbine at Constant Speed and Constant Head
7. Determine the overall efficiency of Francis Turbine at Constant Speed and



Constant Head

8. Determine the overall efficiency of Kaplan Turbine at Constant Speed and Constant Head
9. Determine the overall efficiency of Single Stage Centrifugal pump at Constant Speed and Constant Head
10. Determine the overall efficiency of Multistage Centrifugal pump at Constant Speed and Constant Head
11. Determine the overall efficiency of Reciprocating pump at Constant Speed and Constant Head
12. Determine the Turbine Speed and Flow rate by using Turbine Flow meter

Teaching Methodology

Experimental Test Rigs, Turbines and Pumps