

FLUID MECHANICS & MACHINERY LAB
B.E, V Semester, Mechanical Engineering
[As per Choice Based Credit System (CBCS) scheme]

Course Code	17MEL57	CIE Marks	40
Number of Lecture Hours/Week	03 (1 Hour Instruction+ 2 Hours Laboratory)	SEE Marks	60
RBT Levels	L1, L2, L3	Exam Hours	03

Credits – 02

Course Objectives:

1. This course will provide a basic understanding of flow measurements using various types of flow measuring devices, calibration and losses associated with these devices.
2. Energy conversion principles, analysis and understanding of hydraulic turbines and pumps will be discussed. Application of these concepts for these machines will be demonstrated. Performance analysis will be carried out using characteristic curves.

PART A

1. Lab layout, calibration of instruments and standards to be discussed
2. Determination of coefficient of friction of flow in a pipe.
3. Determination of minor losses in flow through pipes.
4. Application of momentum equation for determination of coefficient of impact of jets on flat and curved blades
5. Calibration of flow measuring devices.
6. Orifice meter
 - o Nozzle
 - o Venturimeter
 - o V-notch

PART B

1. Performance on hydraulic Turbines
 - a. Pelton wheel
 - b. Francis Turbine
 - c. Kaplan Turbines

2. Performance hydraulic Pumps
 - a. Single stage and Multi stage centrifugal pumps
 - b. Reciprocating pump
3. Performance test on a two stage Reciprocating Air Compressor
4. Performance test on an Air Blower

PART C(Optional)

1. Visit to Hydraulic Power station/ Municipal Water Pump House and Case Studies
2. Demonstration of cut section models of Hydraulic turbines and Pumps.

Course outcomes:

- Perform experiments to determine the coefficient of discharge of flow measuring devices.
- Conduct experiments on hydraulic turbines and pumps to draw characteristics.
- Test basic performance parameters of hydraulic turbines and pumps and execute the knowledge in real life situations.
- Determine the energy flow pattern through the hydraulic turbines and pumps
- Exhibit his competency towards preventive maintenance of hydraulic machines

Reading:

1. K.L.Kumar. "Engineering Fluid Mechanics" Experiments, Eurasia Publishing House, 1997
2. Jagdish Lal, Hydraulic Machines, Metropolitan Book Co, Delhi, 1995
3. George E. Totten, Victor J. De Negri "Handbook of Hydraulic Fluid Technology, Second Edition, 2011.

Scheme of Examination:

ONE question from part -A: 50 Marks
 ONE question from part -B: 30 Marks
 Viva –Voice : 20 Marks
 Total: 100 Marks