Thermal Engineering Laboratory-1			
Hours/Week L-T-P:	0-0-3	Credits:	1.5
Course Type:	Laboratory Course	Course Code:	MS2503

Course Objectives:

- To identify the behavior of analytical models introduced in lecture to the actual behavior of real fluid flows.
- To explain the standard measurement techniques of fluid mechanics and their applications.
- To illustrate the students with the components and working principles of the Hydraulic machines- different types of Turbines, Pumps, and other miscellaneous hydraulics machines.
- To analyze the laboratory measurements and to document the results in an appropriate format.

Course Outcomes:

Students who successfully complete this course will have demonstrated ability to:

CO1: Describe the measurement techniques of fluid mechanics and its appropriate application.
CO2: Interpret the results obtained in the laboratory for various experiments.
CO3: Compare the results of analytical models introduced in lecture to the actual behavior of real fluid flows and draw correct and sustainable conclusions

CO4: Perform test on centrifugal pump, reciprocating pump, turbines.

List of Experiments:

Any 10 experiments from the following

1. Experiments on flow through pipes and application of Bernoulli's principle
2. Determination of metacentric height and application to stability of floating bodies.
3. Determination of C_v and C_d of orifices.
4. Experiments on impact of jets
5. Experiments on performance of centrifugal pump
6. Experiments on performance of reciprocating pump
7. Experiments on Reynold's Apparatus
8. Experiments on performance of gear oil pump
9. Verifications of momentum equation
10. Study on Pelton / Francis / Kaplan Turbine
11. Study of steam power plant.
12. Study of refrigeration system.
13. Study of gas turbine power plant.
14. Measurement of steam quality using calorimeter
15. Verification of Joule-Thomson coefficient.

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