COURSE CONTENT

HYDRAULICS AND HYDRAULIC MACHINERY LABORATORY								
IV Semester: CE								
Course Code	**Category**	**Hours/ Week**			**Credits**	**Maximum Marks**		
2540175	**Core**	**L**	**T**	**P**	**C**	**CIA**	**SEE**	**Total**
		0	0	2	1	40	60	100
Contact Classes: Nil	**Tutorial Classes: Nil**	**Practical Classes: 30**				**Total Classes: 30**		
Prerequisites: NIL								

Course Overview :

Hydraulics and Hydraulic Machinery Laboratory offers practical experience in fluid mechanics and hydraulic equipment. The course involves experiments on flow measurement, pipe and channel hydraulics, pumps, turbines, and water engines, emphasizing performance evaluation, efficiency calculation, and real-world applications to develop skills in analyzing and operating hydraulic systems effectively.

Course Objectives: The objective of this Course is to

- I**dentify** the behavior of analytical models introduced in lecture to the actual behavior of real fluid flows.
- E**xplain** the standard measurement techniques of fluid mechanics and their applications.
- I**llustrate** the students with the components and working principles of the Hydraulic machines- different types of Turbines, Pumps, and other miscellaneous hydraulics machines.
- A**nalyze** 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:

- **Describe** the basic measurement techniques of fluid mechanics and its appropriate application.
- **Interpre**t the results obtained in the laboratory for various experiments.
- **Discover** the practical working of Hydraulic machines-different types of Turbines, Pumps, and other miscellaneous hydraulics machines.
- **Compare** the results of analytical models introduced in lecture to the actual behavior of real fluid flows and draw correct and sustainable conclusions.
- Write a technical laboratory report

List of Experiments

1. Verification of Bernoulli's equation
2. Determination of Coefficient of discharge for a small orifice by a constant head method

3. Calibration of Venturimeter/ Orifice Meter
4. Calibration of Triangular/Rectangular/ Trapezoidal Notch
5. Determination of Minor losses in pipe flow
6. Determination of Friction factor of a pipeline
7. Determination of Energy loss in Hydraulic jump
8. Determination of Manning's and Chezy's constants for Open channel flow.
9. Impact of jet on vanes
10. Performance Characteristics of Pelton wheel turbine
11. Performance Characteristics of Francis turbine
12. Performance characteristics of Kaplan Turbine
13. Performance Characteristics of a single stage/multistage Centrifugal Pump