FLUID MECHANICS AND HYDRAULIC MACHINERY LABORATORY

V Semester: CE

Course Code	Category	Hours / Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
ACE107	Core	-	-	3	2	30	70	100
Contact Classes: Nil	Tutorial Classes: Nil	Practical Classes: 36				Total Classes: 36		

COURSE OBJECTIVES(CO'S):

The course should enable the students to:

I. Enrich the concept of fluid mechanics and hydraulic machines.
II. Demonstrate the classical experiments in fluid mechanics and hydraulic machinery.
III. Correlate various flow measuring devices such as Venturimeter, orifice meter and notches etc.
IV. Discuss the performance characteristics of turbines and pumps

COURSE LEARNING OUTCOMES (CLOs):

At the end of the course, the student will have the ability to:

1. Calibration of Venturimeter & Orifice meter
2. Coefficient of discharge for a small orifice / Mouth piece by constant head method.
3. Calibration of contracted rectangular notch / triangular Notch.
4. Determination of friction factor of pipe
5. Co-efficient for minor losses in different types of pipes.
6. Verification of Bernoulli"s Equation
7. Impact of jet on vanes
8. Performance test on Pelton wheel turbine
9. Performance test on Francis turbines
10. Performance characteristics of a single stage Centrifugal pump
11. Performance characteristics of multi- stage Centrifugal pump
12. Performance characteristics of a Reciprocating pump
13. Study of hydraulic jump

LIST OF EXPERIMENTS	
Week-1	**INTRODUCTION TO FLUID MECHANICS & HYDRAULIC MACHANERY LABORATORY**
Introduction	
Week-2	**CALIBRATION OF VENTURIMETER & ORFICEMETER**
Calibration of Venturimeter & Orifice meter	
Week-3	**DETERMINATION OF COEFFICIENT OF DISCHARGE FOR A SMALL ORIFICE / MOUTH PIECE BY CONSTANT HEAD METHOD**
Coefficient of discharge for a small orifice / Mouth piece by constant head method	
Week-4	**CALIBRATION OF CONTRACTED TRIANGULAR NOTCH AND RECTANGULAR NOTCH**
Calibration of contracted rectangular notch / triangular Notch	

Week-5	**DETERMINATION OF FRICTION FACTOR OF PIPE / MINOR LOSSES**
Determination of friction factor of pipe / minor losses in different types of pipes	
Week-6	**VERIFICATION OF BERNOULLI"S EQUATION**
Verification of Bernoulli"s Equation	
Week-7	**IMPACT OF JET ON VANES**
Impact of jet on vanes	
Week-8	**PERFORMANCE TEST ON PELTON WHEEL TURBINE**
Performance test on Pelton wheel turbine	
Week-9	**PERFORMANCE TEST ON FRANCIS TURBINE**
Performance test on Francis turbines	
Week-10	**PERFORMANCE CHARACTERISTICS OF A SINGLE STAGE CENTRIFUGAL PUMP**
Performance characteristics of a single stage Centrifugal pump	
WeeK-11	**PERFORMANCE CHARACTERISTICS OF A MULTI – STAGE CENTRIFUGAL PUMP**
Performance characteristics of multi- stage Centrifugal pump	
Week-12	**PERFORMANCE CHARACTERSTICS OF A RECIPROCATING PUMP**
Performance characteristics of a Reciprocating pump	
Week – 13	**STUDY OF HYDRAULIC JUMP**
Study of hydraulic jump	
Week - 14	**REVISION**

Text Books:

1. Manoj Kumar Rout , "Lab manual for Fluid Mechanics and Hydraulic Machines" BT University, 2008.
2. Dr. N. Kumar Swamay, "Fluid Mechanics and Machinery Laboratory manual", Charator publications.

Web References:

1. Modi, Seth, "Fluid Mechanics. Hydraulic and Hydraulic Machines", Standard Book House, 2011.
2. Annapureddy Domodara Reddy, " Fluid Mechanics and Hydraulic Machines Lab manual", LAMBERT Academic Publications.
3. Madan Mohan Das, Mimi Das Saikia, Bhargab Mohan Das, "Hydraulics and Hydraulic Machines Textbook", PHI Learning, 1st edition, 2013.