

**COURSE TITLE : HYDRAULICS LAB**  
**COURSE CODE : 402**  
**COURSE CATEGORY : A**  
**PERIODS/WEEK : 3**  
**PERIODS/SEMESTER : 54**  
**CREDITS : 2**

**TIME SCHEDULE**

<b>MODULE</b>	<b>TOPIC</b>	<b>PERIODS</b>
I	Bernoulli's theorem, Orifices & Notches, Venturimeter, Pipe friction apparatus, Channel flow	37
II	Francis turbine, Centrifugal Pump & Reciprocating Pump, Hydraulic Ram	17
	<b>TOTAL</b>	<b>54</b>

**OBJECTIVE**

1. To demonstrate the use of Bernoulli's theorem apparatus
  - 1.1 Explain Bernoulli's theorem
  - 1.2 Verify Bernoulli's theorem using the apparatus
  - 1.3 Draw the graph – length of pipe Vs total energy
  - 1.4 Interpret the curve
2. To appreciate the coefficient of discharge through orifices and notches
  - 2.1 Differentiate between orifices and Notches and their functions
  - 2.2 Determine the coefficient of discharge of notch and orifice
  - 2.3 Plot the graph-discharge Vs coefficient of discharge
  - 2.4 Calibrate a given notch
3. To appreciate the coefficient of discharge through venturimeter
  - 3.1 State the function and application of a venturimeter
  - 3.2 Determine the coefficient of discharge
  - 3.3 Calibrate a given venturimeter
4. To determine the coefficient of friction
  - 4.1 Explain the theorem coefficient of friction in pipes
  - 4.2 State the effort of friction in pipes
  - 4.3 Determine the coefficient of friction of pipes of different diameters
  - 4.4 Plot total energy line and hydraulics gradient line
5. To find Chezy's co-efficient
  - 5.1 Study the characteristics of channel
  - 5.2 Explain the term Chezy's constant, hydraulic mean depth
  - 5.3 Study the Chezy's Co-efficient of wetted perimeter for channel flow
6. To understand the characteristics curves of turbines.
  - 6.1 State the conditions under which each type is preferred
  - 6.2 Working principle and parts
- 7 To study the characteristics curves of centrifugal pump and reciprocating pump
  - 7.1 Differentiate between centrifugal pump and reciprocating pump
  - 7.2 State the function, principle and working of each type
  - 7.3 State the application of each type
- 8 To draw the graph – discharge Vs efficiency of hydraulic Ram

- 8.1. State the function of hydraulic Ram
- 8.2. Explain the working of hydraulic Ram

### **COURSE CONTENT**

1. Verification of Bernoulli's theorem using the apparatus
2. Tests on orifices and notches
  - (i) Coefficient of discharge of different orifices and notches
  - (ii) Calibration of notches and orifices
3. Test on venturimeters
  - (i) Coefficient of discharge of the venturimeter
4. Test on pipe friction apparatus
  - (i) Friction factor using Darcy's formulae of pipes of varying cross section.
  - (ii) Plot TEL and HEL.
5. Characteristics flow through channel & find Chezy's constant
6. Study of turbines.
7. Test on centrifugal pump and reciprocating pump – operation of the pump
8. Study on hydraulic Ram operation