**COURSE TITLE**       **: FLUID MECHANICS LABORATORY**
**COURSE CODE**       **: 3029**
**COURSE CATEGORY**       **: B**
**PERIODS/ WEEK**       **: 3**
**PERIODS/ SEMESTER**       **: 45**
**CREDIT**       **: 2**

**TIME SCHEDULE**

| MODULE | TOPIC | PERIODS |
|:------:|-------|:-------:|
| 1 | Pipe friction apparatus. venturimeter, rotameter and water meter | 11 |
| 2 | Orifice apparatus metacentric height. | 12 |
| 3 | Notch apparatus. Bernoullis theorem | 11 |
| 4 | Pipe fittings. Pipe joints and valves. Minor losses in pipes | 11 |
| | TOTAL | 45 |

**Course Distribution**:

| Module | Name of Module | Course Outcome no. | Total periods per semester | | |
|:------:|----------------|:------------------:|----------------------------|:----:|:-----:|
| | | | Instructional | Test | Total |
| 1 | Pipe friction apparatus. venturimeter, rotameter and water meter | 1 5 | Theory   :<br><br>Practical :11 | | 11 |
| 2 | Orifice apparatus metacentric height. | 2 6 | Theory   :<br><br>Practical :11 | 1 | 12 |
| 3 | Notch apparatus. Bernoullis theorem | 3 4 | Theory   :<br><br>Practical :11 | | 11 |
| 4 | Pipe fittings. Pipe joints and valves. Minor losses in pipes | 7 8 | Theory   :<br><br>Practical :10 | 1 | 11 |
| Total periods per semester | | | | | 45 |

Remarks based on feedback from students, faculty, industry (revision 2010):

**COURSE OUTCOME    :**

| SL.NO. | SUB | STUDENT WILL BE ABLE TO |
|--------|-----|--------------------------|
| 1 | 1 | Understand the pipe friction apparatus. |
| | 2 | Understand the Orifice apparatus |
| | 3 | Appreciate  the Notch apparatus (Rectangular, triangular & trapezoidal) |
| | 4 | Appreciate the  Bernoullis theorem |
| | 5 | Appreciate the venturimeter, rotameter and water meter. |
| | 6 | Comprehend the metacentric height. |
| | 7 | Understand the pipe fittings, pipe joints and valves. |
| | 8 | Understand the minor losses in pipes. |

## CONTENT DETAILS

### MODULE I
Understand the pipe friction apparatus
Use the pipe friction apparatus to determine the Darcy's constant
Explain the term coefficient of friction in pipes
State the effect of friction in pipes
Determine the coefficient of friction of pipes of different diameters
Plot total energy line and hydraulics gradient line
Comments on the graph.
Appreciate the venturimeter, rotameter and water meter
Appreciate the coefficient of discharge through venturimeter
State the functions and applications of a venturimeter
Determine the coefficient of discharge
Plot the graph, discharge Vs head
Comments on curve.

### MODULE II
Understand the Orifice apparatus
Appreciate the coefficient of discharge through orifices
Demonstrate the circular orifices and its functions
Determine the coefficient of discharge
Plot the graph, coefficient of discharge Vs discharge
Comments on graph.
Comprehend the metacentric height.
Use the metacentric apparatus to determine the meta centric height

### MODULE III
Appreciate the Notch apparatus (Rectangular, triangular & trapezoidal)
Demonstrate different types of Notches
Determine the coefficient of discharge of Rectangular Notch
Determine the coefficient of discharge of Triangular Notch

Determine the coefficient of discharge of Trapezoidal Notch
Plot the graph, coefficient of discharge Vs discharge.

Appreciate the Bernoullis theorem
Demonstrate the use of Bernoulli's theorem apparatus
Explain Bernoulli's theorem
Verify Bernoulli's theorem using the apparatus
Draw the graph, total energy Vs Length of pipe
Interpret the curve.

**MODULE IV**

Understand the pipe fittings, pipe joints and valves
Identify the various types of pipe fittings, joints and valves
Understand the minor losses in pipes
Estimate the minor losses in flow through pipes

**TEXT BOOKS**

1. Mechanical Workshop & Laboratory Manual By K. C. John