



**DEPARTMENT OF CHEMICAL ENGINEERING  
NATIONAL INSTITUTE OF TECHNOLOGY SRINAGAR**

| <b>Subject: Fluid Mechanics &amp; Mechanical Operations<br/>Lab. (ChBC-44P)</b> | <b>Syllabus for B.Tech: II year<br/>(4<sup>th</sup> Sem)</b> | <b>Total Course Credit: 2</b> |   |   |
|---|--|-------------------------------|---|---|
|   |  | L                             | T | P |
| Mid-Term  | Final-Term   | 0                             | 0 | 4 |
| 40 (Marks)  | 60 (Marks)   |                               |   |   |

**Course Objective(s):** To develop skills in designing and conducting experiments related to applications of principles of fluid mechanics and mechanical operations.

**Course outcomes (COs):** At the end of the course, student will be able to:

- CO1.** Make velocity measurements using flow meters and viscosity measurements by Stokes Apparatus
- CO2.** Understand the laminar and turbulent flow behaviour, verify Bernoulli's principle and pipe fittings
- CO3.** Understand the classification, conveying and comminution of solids
- CO4.** Understand the theories of sedimentation and to study the settling characteristics of batch settling

### **List of Experiments**

| <b>S.No.</b> | <b>Name of the Experiment</b>                    | <b>Name of the Equipment</b> | <b>YouTube Link</b>   |
|--------------|--|------------------------------|---|
| 1            | Measurement of liquid viscosity by Stokes Method | Stokes Apparatus             | <a href="https://www.youtube.com/watch?v=lzSEasdQc3Q">https://www.youtube.com/watch?v=lzSEasdQc3Q</a> |
| 2            | Verification of Bernoulli's Principle            | Bernoulli's Apparatus        | <a href="https://www.youtube.com/watch?v=3IKYQ7BYU2g">https://www.youtube.com/watch?v=3IKYQ7BYU2g</a> |
| 3            | Flow through Orificemeter                        | Orificemeter                 | <a href="https://www.youtube.com/watch?v=NsW-8FjgpY">https://www.youtube.com/watch?v=NsW-8FjgpY</a>   |
| 4            | Flow through Venturimeter                        | Venturimeter                 | <a href="https://www.youtube.com/watch?v=3wfUev6TQv0">https://www.youtube.com/watch?v=3wfUev6TQv0</a> |

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|---|--|---------------|---|
| 5 | Flow through Rotameter                                   | Rotameter     | <a href="https://www.youtube.com/watch?v=6CdO9inzSRQ">https://www.youtube.com/watch?v=6CdO9inzSRQ</a> |
| 6 | Determine the Efficiency of a Ball Mill                  | Ball Mill     | <a href="https://www.youtube.com/watch?v=XWn0uC4bwOM">https://www.youtube.com/watch?v=XWn0uC4bwOM</a> |
| 7 | study the settling characteristics of slurry experiments | Sedimentation | <a href="https://www.youtube.com/watch?v=6Cs3gW2kX4k">https://www.youtube.com/watch?v=6Cs3gW2kX4k</a> |
| 8 | Sieve Analysis   | Sieve's       | <a href="https://www.youtube.com/watch?v=AM-NrQoRIYY">https://www.youtube.com/watch?v=AM-NrQoRIYY</a> |

### **Books Recommended**

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| 1. | McCabe W. L., Jullian Smith C. and Peter Harriott - Unit operations of Chemical Engineering, 7 <sup>th</sup> Edition, McGraw-Hill international edition, 2005. |
| 2. | Coulson J.M and Richardson. J.F, Chemical Engineering Volume I and II, 5 <sup>th</sup> Edition, Elsevier India, 2006.  |