



**Mechanical Engineering**  
Indian Institute of Science  
Bengaluru, 560 012  
India

**Indian Institute of Science**

*E-mail:* chair.me@iisc.ac.in  
*URL:* www.mecheng.iisc.ac.in  
*Telephone:* +91 (80) 2293 2332 (office)



## ME 244 (JAN) 3:0

### Experimental Methods of Microfluidics

**Instructor(s):** Alope Kumar

**Course description:**

Introduction to experimental methods used in microfluidic systems. Fundamentals of flows at the microscale; emphasis on visualization and quantification of fluid flow at the micron-scale. Brownian motion and its quantification. Particle image velocimetry (PIV), micro-particle image velocimetry ( $\mu$ -PIV) and three-component flow measurement in three dimensions. Measuring displacement at the micron scale; digital image correlation (DIC). Thermometry at the micron-scale; laser induced fluorescence (LIF).

**Prerequisites:**

Background in fluid mechanics and transport phenomena is encouraged. Knowledge of statistical techniques will be beneficial, but not required. Raffel, M., Willert, C., Wereley, S.T., Kompenhans, J, Particle Image Velocimetry, Springer, 2007, Nguyen, Nam-Trung, Wereley, S.T, Fundamentals and Applications of Microfluidics, Artech House, 2006, Li, Dongqing (Ed), Encyclopedia of Microfluidics and Nanofluidics, Springer, 2008

**Resources:**

**Outcomes:**

**Additional information:**

**Course website:**