



PRINCIPLES OF MECHANICAL MEASUREMENT

PROF. DIPANKAR N BASU

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INTENDED AUDIENCE : Undergraduate students of Mechanical Engg. and similar branches; Faculty member associated with Mechanical Engg.; Practicing engineers associated with production/manufacturing industries.

PREREQUISITES : No specific pre-requisite. Fundamental knowledge of Mechanics and basics of Mathematics should be sufficient.

INDUSTRY APPLICABLE TO : Measurement is a topic of fundamental interest in engineering and hence any engineering firm & concerned industry should find this course interesting & valuable.

COURSE OUTLINE :

Measurement is always of fundamental significance to the practicing engineers. For the development of any mechanical design procedure, experiments are of paramount interest. Accordingly measurement and correct interpretation of the concerned observation are necessary part of any standard engineering task and also R&D. present course will introduce the student to the fundamentals of measurement, discussing about various relevant concepts & terminologies. The mathematical background requirement, categorize & analyze various measurement devices will be prepared and a very pertinent discussion on digitalization will be presented of scientific interest, such as displacement, motion, stress, force, flow, pressure, temperature etc., will be discussed in detail.

ABOUT INSTRUCTOR :

Dr. Dipankar N. Basu is an Assistant Professor in the Department of Mechanical Engineering at IIT Guwahati since June 2012. He received his undergraduate and postgraduate degrees from Jadavpur university, Kolkata, and completed his Ph.D from IIT Kharagpur in 2011. He served as an Assistant Professor at IEST Shibpur for four years before joining IIT Guwahati. His principal research interest is in the field of nuclear thermal hydraulics, two-phase flow, supercritical heat transfer, optimization of thermal system and microchannel heat transfer. He is currently working on computational tool development for simulation of flows with free conference publications and also a book chapter on supercritical natural circulation loop. He is a regular reviewer of many reputed international journals and also associated with several sponsored projects.

COURSE PLAN :

- Week 1 :** Introduction to Measurement
- Week 2 :** Response of Measurement Systems
- Week 3 :** Digital Techniques in Measurement
- Week 4 :** Data Processing
- Week 5 :** Displacement Measurement
- Week 6 :** Stress and Strain Measurement
- Week 7 :** Force and Torque Measurement
- Week 8 :** Pressure Measurement
- Week 9 :** Flow Measurement
- Week 10 :** Temperature Measurement
- Week 11 :** Motion Measurement
- Week 12 :** Special Topics