



# A BRIEF INTRODUCTION OF MICRO-SENSORS

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**PRE-REQUISITES** : Basic Physics, Electronics and Mechanics

**INTENDED AUDIENCE** : Interested audience

**INDUSTRIES APPLICABLE TO** : TSMC, ASML, Sandisk, Applied Materials etc. semiconductor and process technology based companies

### **COURSE OUTLINE :**

Main objective of this course is to introduce students to micro- and nano-scale devices. After successfully completing this short course, students will have an idea about MEMS and NEMS devices and their applications. They will know how to design, analyze and characterize a micro or nano system. They will also have an idea about MEMS fabrication.

### **ABOUT INSTRUCTOR :**

Prof. Santanu did his undergraduate in Physics and Electronics Engineering from Jadavpur University, Kolkata. After that he moved to IISc, Bangalore, for his Masters and Ph.D. in Nanoscience and Engineering, where he worked on material transport and lithography at micro and nano scale. After Ph.D., he joined Weizmann Institute of Science, in Israel, for his Post-Doctoral studies on self-assembled monolayer. Since last October, he is working as a faculty member in Electrical Engineering department of IISER Bhopal. He has received several awards/grants. To name a few –best PhD thesis award from Indian National Academy of Engineers in 2016, Gandhian Young Technical Innovation award in 2017, Freinberg Graduate Scholarship in 2017, Birac-Sristi grant for the year 2017-2018. His research interests are in micro and nano scale devices and sensors, Lithography, IoT System Development, etc.

### **COURSE PLAN :**

**Week 1:** What is small! From millimeter to angstrom; MEMS sensors introduction and application

**Week 2:** Fundamentals of stress-strain, electrostatics and energy dissipation

**Week 3:** Si and its properties; Microfabrication and lithography

**Week 4:** Design and analysis of Micro Sensors; Case study: Accelerometer, Pressure sensor