

Proposal for

Five Days TEQIP Workshop on Nanomaterials based low cost sensor design for applications in IoT (Internet of Things).

- 1. Proposed Dates:** April 2-6, 2018
- 2. No. of Participants:** 30 (Considering only TEQIP Faculty)
- 3. Organizing Team:**

Dr. Amit Acharyya (Electrical Engg) and Dr. Sushmee Badhulika (Electrical Engg) Expert Faculty:

- (i) Dr. Amit Acharyya (Electrical Engg, IITH),
- (ii) Dr. Sushmee Badhulika (Electrical Engg., IITH),
- (iii) Dr. Ashudeb Dutta (Electrical Engg, IITH),
- (iv) Foreign or Indian Expert Faculty (from IISC, IITB, UOH; details TBD)

4. About The Workshop:

Interest in the field of Nanoscience and technology has led to a paradigm shift in sensor technology towards more sensitive recognition layers, low power, and reduced size and more so because of the known fact that silicon-based semiconducting metal oxide technologies will reach its scaling limit in the near future. In addition, silicon based electronics is based on rigid substrates that restricts its application in certain areas such as wearable electronics. Hence, a parallel field of research has gained momentum in the past few decades that deals with developing flexible substrate based electronics that can be used in numerous applications owing to versatility and pliability. Flexible Nano sensors can be easily integrated with modern electronic fabrication technologies for various applications in real life from healthcare to defence, from human computer interaction to imaging, futuristic technologies including the internet of things (IoT). This further demands amalgamation of novel sensing devices interfaced with the ultra-low power digital processing platform on the same miniaturized fabric. Keeping such requirement in mind, this workshop intends to provide an insight into the– flexible substrate based nano sensors, detection techniques, interfacing techniques, digital/ embedded system design and cover the aspects of device, Circuits and systems with several practical applications including IoT.

Topics to be covered:

Introduction to flexible electronics, Fundamentals of sensor, Emergence of nano sensors, Sensor Materials- synthesis and properties, Sensor Design Process flow; Mixed Signal CMOS Sensing Interface Design, Self-sustainable Sensing Interface; Concepts and applications of digital signal processing systems design methodologies; Low power design technique, real time system implementation methodologies, digital and flexible electronics and its applications including IoT (Internet of Things) Applications of nano sensors, Hands on sessions on flexible substrate based nanosensors and demonstration.