



Centre of Excellence in Macroelectronics

Certification by Hind High Vacuum



Internship Modules for Engineering students

Module 1: Polymer Based Thin Film Sensors / Membranes for Functional Applications

Sub Modules:

1. Electrospinning process for sensors Polymer thin films for sensors
2. Electro spun nanofibers for biomedical applications
3. Numerical analysis of thin films
4. Study of Electrical, Piezoelectric & Mechanical Properties of polymer films for wearable electronics
5. EMI Shielding using Polymer composites
6. Sensors for Wearable electronics
7. Fabrication (Spin coating, Electrospinning, Solution Casting) & Characterization of polymer thin films
8. Stretching effect on thin films
9. Design and development of sensors for the detection of toxic gasses
10. Cellulose based bio-polymer for thermal insulation

Module 2: Laser Surface Texturing of Materials

Sub Modules:

1. Live demonstration of Laser Surface Texturing Machine – Operation and parametric study
2. Live demonstration of Measurement of responses – Optical Microscope, Tally Surf – Surface Roughness,
3. Measurement of responses using Gwyddion software and
4. Minitab for statistical analysis
5. Simulation of the process using COMSOL Multiphysics
6. Surface texturing of 3D printed substrates

Module 3: Fabrication and Characterization of Coatings

Sub Modules:

1. Preparation and Characterization of chalcogenide Materials for phase change memory applications
2. Design and implementation of Electronic Biosensor for Physiological variation
3. Design, fabrication, characterization, and applications of metal oxide thin films for sensing and electronics applications

Module 4: Sensor Modelling

Sub Modules:

1. ML based Sensor Modelling & Data Analytics using python
2. MEMS based sensor and device modelling using COMSOL

Module 5: Wearable Circuit Design

Sub Modules:

1. Design of signal acquisition and conditioning circuit for energy harvesting systems and wearable sensors
2. Design and Simulation of Wearable Antennas



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Module 6: Modelling Of Futuristic Nano Electronics Devices and Sub-10 Nm MOSFET

Sub Modules:

1. Quantum Wells, Wires and Dots simulation and analysis for emerging quantum computing
2. Stanford 2D Semiconductor Quasi-Ballistic Transistor Compact Model for modern sub-10 nm MOSFET
3. Carbon Nanotube (CNT) and Carbon Nanowire FET for next generation processors
4. TCAD simulation of thin film transistor for flexible electronics display & circuits

Module 7: Numerical Simulation to Study Materials

Sub Modules:

1. Characterization of the porosity of a material
2. Simulating the effect of agglomeration in thin film deposition
3. Correlated interface in multilayer graphene-aa and ab
4. Studying the tunability of the band gap of multilayer graphene
5. Calculating the optical conductivity in bi-layer graphene
6. Calculating the transverse conductivity in bi-layer graphene

Module 8: Sensor and Supercapacitor

Sub Modules:

1. Graphene based nanocomposite for supercapacitor
2. Carbon quantum dots-based nanocomposite for sensor application
3. Graphitic Carbon- ferrite nanocomposite materials for gas sensor applications

Module 9: Digital Gamma Spectroscopy Using Python Programming

Sub Modules:

1. Positron lifetime and energy resolution studies from annihilation data using python programming

For Further Information Contact:

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