

Course: Sensors and Actuators

Course Code: noc21-ee32

Session: 2020-21

Duration: 12 Weeks

Assessment procedures: Weekly Assignment (25%) + proctored certification Exam (75%)

Curriculum of the Course:

Week 1:

- Basics of Energy Transformation: Transducers, Sensors and Actuators

Week 2:

- Understanding of thin film physics: Application in MOSFET and its variants

Week 3:

- Thin Film Deposition Techniques: Chemical Vapor Deposition (APCVD, LPCVD, UHVCVD, PECVD, ALCVD, HPCVD, MOCVD)

Week 4:

- Thin Film Deposition Techniques: Physical Vapor Deposition (Thermal Deposition, E-beam Evaporation, Sputtering, Pulsed Laser Deposition)

Week 5:

- Basic understanding of Photolithography for patterning layer. Detailed overview of Etching methods.

Week 6:

- Understanding various gas sensors: Optical gas sensor, Metal oxide semiconductor gas sensor, Field effect transistor gas sensor, Piezoelectric gas sensor, Polymer gas sensor, Nano-structured based gas sensors

Week 7:

- Design and fabrication process of Microsensors: Force Sensors, Pressure Sensors, Strain gauges and practical applications

Week 8:

- Explain working principles of Actuators. Piezoelectric and Piezoresistive actuators, micropumps and micro actuators with practical applications

Week 9:

- Understanding basics of microfluidics to assist Photomask design using Clewin Software, pattern transfer techniques, PDMS moulding and degassing, device bonding techniques.

Week 10:

- Simulation, Optimization and characterization of various sensors using COMSOL Multiphysics

Week 11:

- Understanding of Sensor Interfacing with Microprocessor to build electronic system

Week 12:

- Static and Dynamic Characteristic Parameters for Sensors and Actuators, Calibration of Sensor based electronics systems

List of students enrolled

S. No.	Name of Student
1.	Ayush Kumar Jajodia
2.	Gorakh Gupta
3.	Rakshit khandelwal
4.	Nikhil Singh
5.	Ritik Verma
6.	MADHAV SHARAMA
7.	TUSHAR MITTAL