SS 810 NANOMATERIALS FOR BIOSENSORS 3-1-0-4

Introduction to Biosensors: major classification of sensor- characteristic parameters of sensor-material property for designing biosensors. Introduction to Nanomaterials : Size dependence of properties –Surface to volume ratio and Quantum confinement. Microscopic techniques to study nano structures-SEM, AFM – TEM and STM.Spectroscopic techniques to characterize nano structures –Raman, XPS, Auger, EDAX. Synthetic approaches : Colloidal, Self – Assembly(self assembled monolayers-SAMs)and electrostatic self assembly, electrochemical methods(cathodic and anodic processes),sol-gel, Langmuir-Blodgett(lb) technique,chemical vapour deposition,plasma arcing and ball miling, lithography. Electrochemistry of nanostructures.Carbon nanotubes and Graphenes.Quantum Dots,wells and wires-
Preparation,properties and biosensing applications: metallic and semiconducting quantum dots, wells and wires. Biofunctionalisation of nanomaterials, Mimic enzyme for biosensing, molecularly imprinted polymers, surface Plasmon resonance- Fluorescence Rsonance energy transfer (FRET) – Dendirmeric structures for biosensing.Basic experiments in biosensor characteristics and modeling.

TEXT BOOKS/REFERENCES:

1. Huangxian Ju,Xueji Zhang and Joseph Wang, "*NanoBiosensing , Principles , Development and Application*",Springer,2011.
2. Arben Merkoci (Editor), *"Biosensing using Nanomaterials",*John Wiley & Sons,2009.
3. Alexei Nabok, *"Organic and Inorganic Nanostructures*",Artech House,Inc.,2005.
4. Zhong Lin Wang (Editor), "*Characteristion of Nanophase Materials*", Wiley VCH,2000.