

PROGRAM STRUCTURE

Bionanotechnology and Its Medical Applications Program

Module 1: Nanotechnology - Nano [Chemistry, Physics, Biology]

Nanochemistry:

- Basics of Nanochemistry
- Nanoparticles
- Carbon Nanotubes
- Nanocomposites

Nanophysics:

- Basics of Nanophysics
- Nano Electronics
- Nano Robotics
- Nano Magnetism

Nanobiology:

- Basics of Nanobiology
- Nanobiology Today
- Nanomedicine
- Biomedical Applications of Nanobiology

Module 2: Bio- Nano - Concepts & Fundamentals

- Overview of Bio-Nanotechnology
- Nature Inspired Bio Nanotechnology
- Physics of Bio- Nanotechnology
- Self Assembly Nanostructures
- Bio-Nanotechnology & Toxicology

Module 3: Bio-Nanomaterials- Concepts & Fundamentals

- Dimensions & Structures
- Classifications of Bio Nanomaterials
- Properties & Applications
- Preparation methods & Tools
- Characterization and Manipulation
- Functional Bionanomaterials
- Nanocomposite Biomaterials

Module 4: Bio-Nano Medical -Technology & Applications

- Imaging & Diagnostics
- Cancer Detection and Cure
- Drug Delivery
- Tissue Regeneration
- Disease Diagnosis and Screening
- Nanomedicines
- Microfluidics
- Neurobioelectronics
- Bioelectronics
- Quantum Dots for Biomarkers
- Molecular Electronics
- Biosensor and Biochips

Module 5: Methods & Tools for Measuring Bio- Nano Properties

- Structure Resource
- Microscopy Resource
- Spectroscopy Resource

Module 6: Bio Nanotechnology Laboratory & Lab Procedure

- Safety practices in Bionanotechnology Resource
- 1-D systems. Functionalized nanoparticles for selective recognition of biomolecule Resource
- 2-D systems. Nanoscale model systems for targeted drug delivery Resource
- 3-D systems. Microfluidics as a platform for advanced protein separation Resource