

CY-416 NANOTECHNOLOGY

Nanochemistry: Introduction, definition , length scales , importance of nanoscale and its technology , self- assembly of materials , self-assembly of molecules, porous solids, nanowires, nanomachines and quantum dots.

Nano Particles: Introduction , types of nanoparticles , preparation, properties and uses of gold, silicon, silver, zinc oxide, iron oxide, alumina and titania nanoparticles.

Synthetic Techniques: Equipment and processes needed to fabricate nano devices and structures, top down and bottom up approaches, common growth methods .

Nano Materials: Preparation, properties and applications of carbon nanotubes, nanorods, nano fibre and nanoclay.

Instrumental Techniques: Electron microscopes -- scanning electron microscopes (SEM) -- transmission electron microscopes (TEM) -- scanning probe microscopy -- atomic force microscopy (AFM) -- scanning tunneling electron microscope (STEM) -- basic principles only.