Course Title: Molecular Nanotechnology
Course Code: CHE-816
Credit Hours: 3-0
Prerequisite: Nil

Course Objectives
- The main objective of this course is to provide students an understanding regarding the principles and applications of nanotechnology.
- This course will address the most exciting, novel and interdisciplinary issues in nanotechnology.
- Students will be introduced with the key concepts and state of the art research in the areas of top down and bottom up synthesis, nanoparticles synthesis and applications, carbon nanotubes and graphene chemistry, electron microscopy, nano-biotechnology and nanosensors.

Course Outcomes
The students will have developed knowledge and skills in the following broad areas:
- Critically evaluate and solve problems related to nanotechnology.
- Concepts and research skills concerning synthesis, characterization and applications of nanomaterials.
- Development of good research practice and effective reporting on research outcomes.

Course Contents
- Introduction to Nanotechnology and Supramolecular Chemistry
- Principles of Molecular Recognition
- Top-down approach, bottom-up approach and nanofabrication
- Self-assembly and self-assembled monolayers, Molecular electronics
- Nanoparticles: production and characterization techniques.
- Electrochemical techniques; applications in biological and chemical detection
- Characterization Techniques: electron microscopy, atomic force microscopy, etc.

Recommended Books