

SHREE GOVIND GURU UNIVERSITY
Proposed Syllabus
B.Sc. Sem - I & II
Elective Course: Introduction of Nanotechnology

Unit-I : Concept to Nanotechnology

History, Understanding electron-atom-molecule, Understanding metal and materials, Understanding Nanoscale, How size matters & changes in properties, Challenges, Fiction and Hazard, Future scopes.

Unit-II : Introduction to Synthesis of Nonmaterials

High Energy Ball Milling, Melt Mixing, Physical Vapour Deposition (PVD), Chemical vapour Deposition (CVD), Sputtering, Chemical Reduction Method, Sol-gel Method, Self Assembly.

Unit-III : Basics of Characterization Techniques for Nanomaterials

Atomic Force Microscope (AFM), Scanning Electron Microscope (SEM), X-Ray Diffraction (XRD), Fourier Transfer Infra-Red (FTIR) Spectroscopy, Ultrasonication Technique, Microlithography and MEMS,

Unit-IV : Application of Nanotechnology

Identified potential Application, Solar Energy Conversion (Solar Cell), Polymers, Liquid crystal, Biosensors, Nanomedicines, Nanobiotechnology.

Text Book:

- Nanotechnology: Principles and Practices by Sulbha K Kulkarni, Capital Publishing Co. New Delhi.
- Nanotechnology: Technology Revolution of 21st Century By Rakesh Rathi, S.Chand & Company, New Delhi.

Reference:

1. Introduction of Nanotechnology, C.P.Poole Jr. and F. J. Ownes, Wiley
2. Nanoscience and Technology eds. R.W.Kelsall, I.W. Hemley & M.Geoghehan, John Wiley and sons.
3. Introduction to Nanoscience and nanotechnology by K.K.Chattopadhyay and A.N. Banerjee, PHI Learning Pvt. Ltd. 2012.
4. Origin and Development of Nanotechnology, P.K.Shrma, Vista International.
5. Introduction to Nanoscience, S. M. Lindsay (Oxford Press)
6. Nano; The Essentials, T.Pradeep (Tata McGraw Hill)
7. Nanostructures and Nanomaterials: Synthesis Properties and Application: G.Cao, ICP, London, 2004.
8. Nanobiotechnology, Concept, Applications and perspectives: C.M. Niemeyer and C.A. Mirkin, WILEY-VCH, Verlag GmbH & Co, 2004.
9. Nanotechnology: Mark Ratner and Daniel Ratner, Person Education.
10. Nanomaterials: A.K. Bandyopadhyay; New Age International Publishers.