

5	Testing of Biomaterials: Biocompatibility, blood compatibility Toxicity tests, <i>In-vitro</i> and <i>In-vivo</i> testing.	9
Total		42

Books:-

S.No.	Name of Books/ Author/Publisher
1.	S. V. Bhat. Biomaterials, Springer.
2.	J.B. Parkand, JD Boonzino. Biomaterials: Principles and Application, CRC Press.
3.	J. Black. Biological Performance of materials, Taylor & Francis.
4.	J. B. Parkand, R. S. Lakes. An Introduction to Biomaterials, Springer.
5.	B. D. Ratner, F. J. Schoen, A. S. Hoffman, J. E. Lemons. Biomaterials Science: An introduction to Materials in medicine, Academic Press.

Nanobiotechnology and Nano biomedicine

Details of course: -

Course Title	Course Structure			Pre-Requisite
	L	T	P	
Nanobiotechnology and Nanobiomedicine (336)	3	0	2	NIL

Course Objective:

To establish careers in their branch of study, ie., Nanotechnology or Nanomedicine, or the interdisciplinary and multidisciplinary fields.

Course Outcome (CO):

1. To understand the basic principles of nanosciences
2. Illustrate the various synthesis and characterization methods.
3. To explain the various types of nanomaterials and their potential application in diagnosis and therapy

4. To provide the details of biosensors and their application
5. Understanding the nanotoxicology and its management.

S.No.	Content	Contact Hours
1	Introduction to Nanobiotechnology, basic principles of nanoscience.	8
2	Synthesis and characterization of nanomaterials, Top-down and Bottom-up approach for nano synthesis. characterizing nanomaterials for their morphology, structure, chemistry, and functionality through diverse methods of microscopy, spectroscopy	12
3	Types of nanomaterials and application in medicine. QDs, Dendrimers, inorganic and organic nanoparticles, carbon nanotubes liposomes, nanopore, drug delivery applications in diagnosis and therapy, Nano biomaterials, interface of tissue and nano biomaterials, Lab-on-a-Chip	10
4	Biosensors: Introduction to biosensors, the biological component, the sensor surface, Immobilization of the sensor molecule, Applications of molecular recognition elements in nanosensing of different analytes, Application of various transducing elements as part of nano biosensors	6
5	Nanotoxicology: Principles of toxicology; toxicology models, experimental toxicology studies; activation and detoxification mechanisms.	6
		42

Books:

S.No	Name of Book/Author/Publisher
1	Nanobiotechnology: Concepts, Applications and Perspectives, Christof M.Niemeyer (Editor), Chad A. Mirkin (Editor), Wiley VCH.
2	Nanobiotechnology - II more concepts and applications, Chad A Mirkin and Christof M. Niemeyer (Eds), Wiley VCH.
3	Nanotechnology in Biology and Medicine: Methods, Devices, and Applications.
4	D.S. Goodsell, Bionanotechnology: Lessons from Nature, Wiley Press
5	G. Ozin, A. Arsenault, Nanochemistry. A Chemical Approach to Nanomaterials, RSC, London

**Biomaterials
and clinical
devices**

**Details of
course:-**

Course Title	Course Structure			Pre-Requisite
	L	T	P	
Biomaterials and clinical devices (338)	3	0	2	NIL