



SATHYABAMA

INSTITUTE OF SCIENCE AND TECHNOLOGY

(DEEMED TO BE UNIVERSITY)

Accredited "A++" Grade by NAAC | 12B Status by UGC | Approved by AICTE

www.sathyabama.ac.in

Number of value-added courses for imparting transferable and life skills offered during the year 2023-24

Name of the value-added courses (with 30 or more contact hours) offered	Course Code (if any)	Year of offering	No. of times offered during the same year	Duration of course	Number of students enrolled in the year	Number of Students completing the course in the year
Basics of Nano technology and their Biomedical Implications	NIL	2024	1	30 Hrs	71	67



SATHYABAMA

INSTITUTE OF SCIENCE AND TECHNOLOGY
(DEEMED TO BE UNIVERSITY)
CATEGORY - 1 UNIVERSITY BY UGC



SCHOOL OF BIO AND CHEMICAL ENGINEERING DEPARTMENT OF BIOTECHNOLOGY

In Association with

INTERNATIONAL RESEARCH CENTRE
CENTRE FOR NANOSCIENCE & NANOTECHNOLOGY
Organizes

VALUE ADDED COURSE On BASICS OF NANOTECHNOLOGY AND THEIR BIOMEDICAL IMPLICATIONS

DATE

14th March 2024 – 05th April 2024

CHIEF PATRONS

Dr. MARIAZEENA JOHNSON B.E., MBA., M.Phil., Ph.D.,
Chancellor

Dr. MARIE JOHNSON B.E., MBA., M.Phil., Ph.D.,
President

Ms. MARIA BERNADETTE TAMILARASI
Vice President

Mr. J. ARUL SELVAN
Vice President

Ms. MARIA CATHERINE JAYAPRIYA
Vice President

PATRON

Dr. T. Sasipraba M.E., Ph.D.,
Vice Chancellor

CONVENOR

Dr. V. Ramesh Kumar

Associate Professor

Head, Department of Biotechnology

Sathyabama Institute of Science and Technology

RESOURCE PERSON

Dr. Kunal Biswas

Assistant Professor, (Research)

Centre for Nanoscience & Nanotechnology

International Research Centre

ORGANIZERS

Dr. R. Thyagarajan

Associate Professor, Biotechnology

Dr. Prabhakar Singh

Assistant Professor, Biotechnology

Dr. Saqib Hassan

Assistant Professor, Biotechnology



FOR REGISTRATION CONTACT

Dr. Prabhakar Singh - 9120549495

Dr Saqib Hassan -9682537545

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DEPARTMENT OF BIOTECHNOLOGY
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VALUE ADDED COURSE
On
BASICS OF NANOTECHNOLOGY AND THEIR BIOMEDICAL IMPLICATIONS

OBJECTIVES

To provide a practical introduction to the basics of molecular nano-sciences and technology
To explore and understand the significance of sustainable nanotechnology using green route
To understanding the diverse behaviors of nanoparticles synthesis and its biomedical implications

COURSE CONTENT

TOTAL: 30 HRS

Module 1. Introduction to nanotechnology	06 Hours
Module 2. Green synthesis of nanomaterials & characterizations	06 Hours
Module 3. Biogenic synthesis of nanomaterials and characterizations	06 Hours
Module 4. Magnetic nanomaterials and characterizations	06 Hours
Module 5. Biomedical applications of nanomaterials	06 Hours

OUTCOMES

By the end of this course, Students will learn:

1. Nano formulation and its upscaling.
2. To investigate the underlying complexity at the molecular levels for nanobio interface.
3. To understand the relationship between nanotechnological development and its sustainable societal implication.
4. To understand the associated scientific ethics involved with the nanobiotechnological practices.

RELEVANCE TO

PO 3 - Design/development of solutions
PO 4 - Investigation
PO 7 - Environment and sustainability
PO 8 - Ethics
PSO 1
PEO 1
PEO 2





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VALUE ADDED COURSE On **BASICS OF NANOTECHNOLOGY AND THEIR BIOMEDICAL IMPLICATIONS**

DATE
14th March 2024 – 05th April 2024

ATTENDANCE

S. NO.	REG.NUMBER	STUDENT NAME	14/03/24	15/03/24	18/03/24	19/03/24	20/03/24	04/04/24
1	41230001	AARTHI RAGHU	✓	✓	✓	✓	✓	✓
2	41230003	ADITYA.S	✓	✓	✓	✓	✓	✓
3	41230004	A AFRAH	✓	✓	✓	✓	✓	✓
4	41230005	AJAAYSHA P H	✓	✓	✓	✓	✓	✓
5	41230006	AKASH K	✓	✓	✓	✓	✓	✓
6	41230007	AKSHAYA VARDHINI.G	✓	✓	✓	✓	✓	✓
7	41230008	ANCY A	✓	✓	✓	✓	✓	✓
8	41230009	ANKIREDDY MARY MAMATHA	✓	✓	✓	✓	✓	✓
9	41230010	ANU VARSHINI A.M	✓	✓	✓	✓	✓	✓
10	41230011	APARNA M						

11	41230012	A.KAREN	✓	✓	✓	✓	✓	✓
12	41230013	ASWINKUMAR.D.J	✓	✓	✓	✓	✓	✓
13	41230014	A.CATHERIN	✓	✓	✓	✓	✓	✓
14	41230015	CHETHANA.D	✓	✓	✓	✓	✓	✓
15	41230016	DEEPTI VARSHA T.R	✓	✓	✓	✓	✓	✓
16	41230017	DEVADARSAN A	✓	✓	✓	✓	✓	✓
17	41230018	K DIVYAREDDY	✓	✓	✓	✓	✓	✓
18	41230020	H.HANNAH	✓	✓	✓	✓	✓	✓
19	41230021	HARHINI S	✓	✓	✓	✓	✓	✓
20	41230022	HASIKA.R	✓	✓	✓	✓	✓	✓
21	41230023	JEEVANKUMAAR V	✓	✓	✓	✓	✓	✓
22	41230024	D.JESLIN SANJANA	✓	✓	✓	✓	✓	✓
23	41230025	KARTHIKEYAN S	✓	✓	✓	✓	✓	✓
24	41230026	KARTHIKRAAJA U	✓	✓	✓	✓	✓	✓
25	41230027	KARUMANCHI KOUSHAL	✓	✓	✓	✓	✓	✓
26	41230029	KEERTHANAA V	✓	✓	✓	✓	✓	✓
27	41230030	KHALIDA UMAR	✓	✓	✓	✓	✓	✓
28	41230031	KRISHNA R MENON	✓	✓	✓	✓	✓	✓
29	41230032	V.G.KRITI	✓	✓	✓	✓	✓	✓
30	41230033	MICHELLE FAUSTINA MARIA	✓	✓	✓	✓	✓	✓
31	41230034	P.R.MRIUTHUN JAIN						
32	41230035	NEHA S	✓	✓	✓	✓	✓	✓
33	41230036	NIMMAGADDA HEMA SRI	✓	✓	✓	✓	✓	✓
34	41230037	NISHITA CUNCHALA	✓	✓	✓	✓	✓	✓
35	41230038	NITHISHKUMAR P	✓	✓	✓	✓	✓	✓
36	41230039	B.PAVITHRA	✓	✓	✓	✓	✓	✓
37	41230040	R PRANAV	✓	✓	✓	✓	✓	✓
38	41230041	PUGAZHESWARAN.M	✓	✓	✓	✓	✓	✓
39	41230042	RAGAMALIKA S	✓	✓	✓	✓	✓	✓
40	41230043	RAGHAVI.S	✓	✓	✓	✓	✓	✓
41	41230044	S.RAHUL HARISH	✓	✓	✓	✓	✓	✓
42	41230046	GAJULAPALLI RAMADEVI	✓	✓	✓	✓	✓	✓

43	41230047	RENIE LEORA CASILDA.D	✓	✓	✓	✓	✓	✓
44	41230048	ROHITH.S	✓	✓	✓	✓	✓	✓
45	41230049	S ROHIT KRISHNA	✓	✓	✓	✓	✓	✓
46	41230050	SAKTHIRAJAN R	✓	✓	✓	✓	✓	✓
47	41230051	SAMHITA GANUGULA	✓	✓	✓	✓	✓	✓
48	41230052	A.SANDHYA SREE						
49	41230053	M SANJAY KUMARAN	✓	✓	✓	✓	✓	✓
50	41230054	SARITHRA.A.P	✓	✓	✓	✓	✓	✓
51	41230055	Y.SASHANK REDDY						
52	41230056	SATHEYESH M	✓	✓	✓	✓	✓	✓
53	41230057	SHARMILA. J	✓	✓	✓	✓	✓	✓
54	41230058	SHREYA RAMESH	✓	✓	✓	✓	✓	✓
55	41230059	SMRITI JAYACHANDRAN	✓	✓	✓	✓	✓	✓
56	41230060	P.SRI SAMYUKTHA YADAV	✓	✓	✓	✓	✓	✓
57	41230061	B.SRINIDHI	✓	✓	✓	✓	✓	✓
58	41230062	A.SRIRAM	✓	✓	✓	✓	✓	✓
59	41230063	SURUTHIKA.V	✓	✓	✓	✓	✓	✓
60	41230064	SUVALAKSHMI G.S	✓	✓	✓	✓	✓	✓
61	41230065	SWASTI SWATI	✓	✓	✓	✓	✓	✓
62	41230066	SWEETHA.P	✓	✓	✓	✓	✓	✓
63	41230067	S SWETHA	✓	✓	✓	✓	✓	✓
64	41230068	TANISHA SUTRADHAR	✓	✓	✓	✓	✓	✓
65	41230069	VANI.B	✓	✓	✓	✓	✓	✓
66	41230070	VARSHA.A	✓	✓	✓	✓	✓	✓
67	41230071	D.VARSHA	✓	✓	✓	✓	✓	✓
68	41230072	VESHALI.H	✓	✓	✓	✓	✓	✓
69	41230073	A.VIMAL	✓	✓	✓	✓	✓	✓
70	41230074	VISHAKA K S	✓	✓	✓	✓	✓	✓
71	41230075	VIVEKANANDHAN GAYATHRI	✓	✓	✓	✓	✓	✓

SYLLABUS: VALUE ADDED COURSE

Basics of Nanotechnology and their biomedical implications	L	T	P	Credits
	10	0	20	0

COURSE OBJECTIVES:

- To provide a practical introduction to the basics of molecular nano-sciences and technology.
- To explore and understand the significance of sustainable nanotechnology using green route.
- To understanding the diverse behavior of nanoparticles synthesis and its biomedical implications.

MODULE 1:**06 Hours**

Introduction to Nanotechnology: Significance of nanoscale, nanomaterial, Nanomaterials characteristics, Nanotechnology, Approaches of Nanotechnology, Applications of Nanotechnology.

Laboratory: Synthesis of silver nanoparticles, Nimbolide sample sonication with the nanoparticle, Characterization of Nanoparticles.

MODULE 2:**06 Hours**

Green synthesis of nanomaterials & characterizations: Steps involved in Green nanomaterial synthesis, Characterizations, Top down and bottom up techniques of fabrication. **Laboratory:** Preparation of Plant Extract, Synthesis of Nanoparticles, Purification of Nanoparticles, Characterization of Nanoparticles.

MODULE 3:**06 Hours**

Biogenic synthesis of nanomaterials & characterizations: Introduction, Characterizations for probing prepared biogenic nanomaterials, Top down and bottom up techniques of fabrication, Examples of biogenic nanomaterials synthesis, 1: Synthesis of Gold Nanoparticles using Microorganisms, 2: Synthesis of Zinc Oxide Nanoparticles using Fungal Extract. 3: Synthesis of Iron Oxide Nanoparticles using Algae. **Laboratory:** Synthesis of Iron Oxide Nanoparticles using Algae, Purification of Nanoparticles, Characterization of Nanoparticles

MODULE 4:**06 Hours**

Magnetic nanomaterials & characterizations: Steps involved in magnetic nanomaterial synthesis, Characterizations for probing prepared magnetic nanomaterials, Top down and bottom up techniques of fabrication, few significant examples of magnetic nanomaterials synthesis. **Laboratory:** Synthesis of Iron Oxide Magnetic Nanoparticles (Fe_3O_4), Characterization of Nanoparticles.

MODULE 5:**06 Hours**

Biomedical applications of nanomaterials: Nano-Biotechnology and its applications, Characterizations for probing nano-bio interface systems, recent biomedical applications of nanomaterials, Nano-Biosensors in disease diagnostics and therapeutics, Nano-theranostics using nanomaterials, Toxicity, Ethics and regulatory guidelines in nano-bio context. **Laboratory: Working exposure** - X-ray Diffraction (XRD), FTIR, IR, TEM, SEM.

COURSE OUTCOMES

On completion of the course, student will be able to

1. Understand nano formulation and its upscaling
2. To investigate the underline complexity at the molecular levels of Nano bio interface
3. To understand the relationship between nanotechnological development and its sustainable societal implications
4. To understand the associated scientific ethics involved with the nano biotechnological practices

RELEVANCE TO - PO3, PO4, PO7, PO8, PSO 1, PEO1, PEO2, SDG-3, SDG- 4



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-----Certificate of Participation -----

This is to certify that, Mr./Ms./Mrs. _____, a _____ Student (20__ - 20__) of Sathyabama Institute of Science and Technology, has successfully completed value added course on “**Basics of Nano technology and their Biomedical Implications**” organized by the Department of Biotechnology, Sathyabama Institute of Science and Technology from **14th March 2024 – 05th April 2024**.

Dr. V. RAMESH KUMAR

Associate Professor,

Dean, School of Bio and Chemical Engineering

Head, Department of Biotechnology

Sathyabama Institute of Science and Technology

Dr. KUNAL BISWAS

Assistant Professor (Research)

Centre for Nanoscience and Nanotechnology

International Research Centre

Sathyabama Institute of Science and Technology





