

## Centre for Nano Science and Technology (A.Y 2019-20)



### **Centre for Nano Science and Technology** **Institute of Science and Technology** **Jawaharlal Nehru Technological University Hyderabad**



**Professor of NanoTechnology**  
**Head of the Department**  
**CNST, IST, JNTUH**

As the Head of Department, I am pleased to introduce the latest edition of our department's newsletter. This edition highlights the latest achievements, events, and updates within our department. We have had a busy and productive year, with many notable accomplishments that are worth celebrating. Our faculty members have been recognized for their outstanding research contributions, and our students have excelled in their academic pursuits and extracurricular activities. In this edition, you will find articles that showcase the groundbreaking research that our department is conducting, as well as updates on the various events and activities such as GIAN program on cancer theranostics, FDP program on Synthesis and Characterization of Nanomaterials, 3D printing workshop, Workshop on "Sensitization of Socially Challenged Communities- Higher Education" Equity Action Plan, Energy storage workshop that have taken place over the past few months. I would like to extend my gratitude to our faculty, staff, and students who have worked tirelessly to make our department a success. Their dedication and hard work are evident in the many accomplishments we have achieved this year.

**About the Centre:** Centre for Nano Science and Technology (CNST) was established in 2007 at Institute of Science and Technology, Jawaharlal Nehru Technology University Hyderabad with main focus on teaching and research in the field of Nano Technology under the support of DST-Nanomission. Centre has well equipped classrooms with audiovisual facilities, research and computer facilities. The Centre has modern infrastructure for carrying out research in the advanced areas of Nano science and Technology.

### **Mission:**

- Student-centered Teaching-learning processes and a stimulating R&D environment.
- To conduct and support research, development, design and engineering in nanotechnology, and transfer the technology to industrial sector in order to increase India competitiveness, improve the quality of life the environment.
- To establish and sustain state-of-art Infrastructure for professional aspirants hailing from both rural and urban areas by creating an ambience conducive for excellence in technical education and research.

### **Vision:**

- To become a Centre of excellence in multidisciplinary engineering.
- Educate all about presence of Nano Technology in day to day life.
- Cutting edge Research in the field of various technological/engineering aspects
- To create System designers, Scientists, Researchers, Product designers, Nano Technologists.

### **Program Educational Objectives (PEO's):**

- To produce masters who would have developed a strong background in Nanoscience, Nanomaterials, Thin films and ability to use these tools in their chosen fields of specialization.
- To produce masters who have the ability to serve country in the R&D domain on solving the problems in existing engineering aspects using the cutting edge technology tool called nanotechnology.
- To produce masters `who would attain professional competence through life-long learning such as advanced degrees, professional registration, and other professional activities.
- To produce masters who function effectively in a multi-disciplinary environment and individually, within a global, societal, and environmental context.
- To produce masters who would be able to take individual responsibility and to work as a part of a team towards the fulfilment of both individual and organizational goals.

### **Programme Outcomes (PO's):**

- An ability to independently carry out research/investigation development work to solve practical problems.
- An ability to write and present a substantial technical report/document.
- Students will demonstrate a degree of mastery over the area as per the specialization of the program. The mastery should be at a level higher than the requirements in the appropriate bachelor program.
- Recognize the need for multi-disciplinary technologies, exposure to modern tools, environmental sustainability and ability to attain lifelong learning in the broader contest of Nano Technology challenges

### **Strength, Weakness, Opportunity and Challenges(SWOC):**

#### **Strengths:**

- Well-equipped state-of-art facilities and computer laboratories.
- Research oriented faculty with large number of publications in recognized journals.
- Students' engagement in research studies leading to publications/patents/design-based projects and entrepreneurial ventures.
- Financial assistance for research, faculty exchange, professional development programme.
- Guest lectures and interaction with eminent personalities
- Various projects have been given from the first year for understanding the nanoscience from hands on experience.

**Weaknesses:**

- Teaching faculty is working in ad-hoc capacity as the permanent position has not been filled in departments for a decade due to delay at the level of the State Government. Similar situation exists for non-teaching staff too.
- Inadequate levels of participation from foreign students for full time courses

**Opportunities:**

- Improve peer reviewed journal publication (Scopus, citation index, impact factor, h-index).
- Introduction of an organized system of summer internship and industry exposure would enhance employability of the students.
- Enrolling students to online courses at Government of India Swayam Portal would enhance their learning.
- Utilization of UGC Swayam portal for MOOC courses.
- To train students to get better placement.

**Challenges:**

- To increase human resource i.e. teaching and non-teaching employees.
- Attracting core engineering company placements
- Keeping pace with global development in pedagogy and research

**Syllabus Revised: Yes**

Number of Programmes offered: 02

S. No.	Program Name	PG	Sanctioned intake	Year of starting	Regular/Self finance
1	M.Tech(Nano Technology)	PG	25 (18+7)	2007	Regular
2	Ph.D(Nano science and Technology)	Ph.D	-	2010	Regular & Part-Time

Academic Year	Program Name	Program Code	Number of seats sanctioned	Number of students admitted
2019-20	M.Tech (Nanotechnology)	D66	25	16

**Value Added Courses offered:**

1. Analytical Instrumentation (ZETA SIZER, UV, TG-DTA, FTIR, XRD, PARTICLE SIZE ANALYZER) (VAC 10)

**COURSERA:**

1. Introduction to Engineering Mechanics
2. Introduction to Thermodynamics: Transferring Energy from Here to There
3. Mechanics of Materials II: Thin-Walled Pressure Vessels and Torsion
4. Surface Engineering of nanomaterials
5. What is Data Science?

**Mentor-Mentee Details:**

S.No	Mentor name	No. of mentee
1	Dr.CH Shilpa Chakra	5
2	Dr. K.Venkateswara Rao	4
3	Mr.D.Rakesh	3

**Faculty Details:**

Name of the Faculty	Designation	Qualification	Experience (Years)
Dr.K.Venkateswara Rao	Professor of Nanotechnology & Head of the Department	M.Sc.,M.Tech.,Ph.D.,PDF Raman Postdoctoral fellow (2016-17),Johns Hopkins Medicine, USA	22
Dr.CH Shilpa Chakra	Assistant Professor of Nanotechnology & BoS Chairperson i/c for Nanotechnology	B.Tech.,M.Tech., Ph.D	9
Mr.D.Rakesh	Assistant Professor(Contract)	B.Tech.,M.Tech	9

**Student Pass Percentage : 75%****R & D PROJECTS:** 11 (DST SEED, DST SERB, AICTE MODROBS,TEQIP -III)**Full time Research Scholars:**

S.No	Name of the Full-Time Research scholar	Type of Fellowship	Name of the supervisor	Research area
1	B.Geeta Rani	Research Assistantship (RA)	Dr.K.Venkateswara Rao	Gas sensors
2	V. Sai Kumar	Research Assistantship (RA)	Dr.K.Venkateswara Rao	Electrochemical sensors
3	S. Madhuri	Research Assistantship (RA)	Dr.CH Shilpa Chakra	Batteries

**Part-time Scholars:**

S.No	Name of the Research scholar	Name of the supervisor	Research area
1.	S. Sasirekha	Dr. K Venkateswara Rao	Nano Lithium batteries
2.	A.Saineeta	Dr. K Venkateswara Rao	Gas sensors
3.	Neetu Rani.P	Dr. K Venkateswara Rao	Gas sensors

### **Membership in National/International bodies:**

- Life Member of Indian Science Congress
- Life Member of Electron Microscope Society of India
- Life Member of Nano and Molecular Society
- Life Member of Indian Crystallographic Association
- Life Member of Nano Science and Technology Consortium
- Life Member of Powder Metallurgy Association of India
- Life Member of Society for Materials Chemistry

**No of Paper publications: 16**

**No of Workshop/Conferences/seminars Organized: 05**

**No of Workshop/Conferences/seminars attended: 25**

**No of Books published: 03**

### **Research Collaborations:**

**Dr. Ch. Shilpa Chakra :**

1. Department of Material Science and Nano technology, Yogi Vemana University

**No of students placed: 07**

**No of Student progression to higher education: 03**

### **Infrastructure-Learning Resources:**

**No of Class rooms: 01**

**List of ICT enabled tools: LCD Projector, LED TV, Desktop Computers with LAN facility**

**Total No of computers in simulation Lab: 13**



**GIAN course on “Cancer Theranostics**



**A Two-Week AICTE and TEQIP-III Funded FDP on Synthesis and Characterization of Nanomaterials**







**3D Printing workshop**



**A Two Day Workshop on Sensitization of Socially Challenged Communities  
Higher Education Equity Action Plan**



**One day workshop On Energy Storage (ES)**



### Industrial Visit:

S.NO	BATCH	No. Students	Industry	Date of Visit
1	2019-20	12	IICT	20-12-2019



### Tech Fest 2019:



### **Research Outcomes:**

- Developed new types of nanomaterials with unique properties, such as improved strength, flexibility, and conductivity. These materials could be used in a wide range of applications, including sensors, batteries, and medical devices.
- Explored the use of nanotechnology to develop more efficient energy generation and storage systems.
- Developed new methods for detecting and removing pollutants from the environment using nanotechnology.

### **Best practices:**

- Twinning research activity with DEI Agra
- Joint M.Tech project initiated with DEI.



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