NEWS LETTER

Centre for Nano Science and Technology (A.Y 2017-18)





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 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.

Vision:

- 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.

Mission:

- > 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)

Strength's:

- > A variety of courses with adequate internal subject choice offered to students.
- > Well-equipped state-of-art facilities and computer laboratories.
- > Well-qualified teaching faculty to meet the demands of present day teaching-learning.
- > Research oriented faculty with large number of publications in recognized journals.
- > Integrating feedback of stakeholders in curriculum development for OBE.
- ▶ Fully functional CBCS across programme.
- > Active national/international collaborations/MoUs for quality research and academic outcomes.
- > Guest lectures and interaction with eminent personalities.
- Various projects has been given from the first year for understanding the nanoscience from hands on experience.

Weaknesses:

- > Limited number of classrooms and space has hindered introduction of new and popular courses.
- 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.
- > Inadequate commercialization of intellectual property generated.
- > Formal Networking with other institution /organizations to be enhanced.
- > Difficulty to attract sizeable research funds from the Government funding agencies.

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

- Creation of additional space (horizontal or vertical) for research facilities and introduction of new programme.
- > 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	Year of	Regular/Self finance
			intake	starting	
1	M.Tech(Nano	PG	25 (18+7)	2007	Regular
	Technology)				
2	Ph.D(Nano	Ph.D	-	2010	Regular & Part-Time
	science				
	and				
	Technology)				

Academic Year	Program Name	Program Code	Number of seats sanctioned	Number of students admitted
2017-18	M.Tech (Nanotechnology)	D66	25	17

NBA	Granted provisional accreditation for three years for the period
Accreditation	File No. 11-68/2010/NBA (27-12-2016 to 30-06-2018)

NATIONAL BOARD OF ACCREDITATION

BCC Place, East Tower, 4ⁿ Floor, Bhisham Pitamah Marg, ragati Vihar, New Delhi-110 003 9I: +91 11 2436 0620-22, 2436 0654 Telefax: +91 11 2436 0682

File No. 11-68-2010-NBA

То

To The Principal JNTUH Institute of Sci. & Tech. (IST) , Kukatpaliy, Hyderabad, 500085, Telangana

Subject: Accreditation status of programmes applied by JNTUH Institute of Sci. & Tech. (IST) , Kukatpally, Hyderabad, 500085, Telangana.

Sir,

This has reference to your application ID No. 1277 dated 14-03-2015 in Tier-I format seeking accreditation by National Board of Accreditation to PG Engineering programmes offered by JNTUH institute of Sci. & Tech. (IST), Kukapaly, Vyderabad, Solos8, Telangana.

 An Expert Team conducted on-site evaluation of the programmes during 21st to 23rd October, 2016. The report submitted by the Expert Team was considered by the concerned Committees constituted for the purpose in NBA. The Competent Authority in NBA has approved the following accreditation status to the programmes as given in the table below:

S.No	Name of the Programmes (PG)	Basis of Evaluation	Accreditation Status	Period of validity	Remarks
(1)	(2)	(3)	(4)	(5)	(6)
1.	Chemical Technology	Time	Provisionally Accredited	Academic	Accreditation status granted is valid for the period indicated in col.5 or till the program has the approval of the competent authority, whichever is earlier
2.	Nano Technology	Document	Provisionally Accredited	2017 and 2017-2018 i.e., upto 30- 06-2018.	

 It may be noted that only students who graduate during the validity period of accreditation, will be deemed to have graduated with an NBA accredited degree.

4. The Programmes have been granted Provisional Accreditation. JNTUH Institute of Sci. & Tech. (IST), Kukatpaily, Hyderabad, 500085, Telangana should submit the Compliance report at least 6 months before the expiry of validity of accreditation mentioned above.

Contd../-

5. The accreditation status awarded to the programmes as indicated in the above table does not imply that the accreditation has been granted to JNTUH Institute of Sci. & Tech. (IST) , Kukatpally, Hyderabad, 500085, Telangana as a whole. As such the Institution should nowhere along with its name including on its letter head etc. write that it is accredited by NBA because it is programme accreditation and not institution accreditation. If such an instance comes to NBA's notice, this will be viewed seriously. Complete name of the programme(s) accredited level of programmes and the period of validity of accreditation, as well as the date from which the accreditation is effective should be mentioned unambiguously whenever and wherever it is required to indicate the status of accreditation by NBA

-2-

6. The accreditation status of the above programmes is subject to change on periodic review, if needed by the NBA. It is desired that the relevant information in respect of accredited programmes as indicated in the table in paragraph 2, appears on the website and information bulletin of the Institute.

7. The accreditation status awarded to the programmes as indicated in table in paragraph 2 above is subject to maintenance of the current standards during the period of accreditation. If there are any changes in the status (major changes of faculty strength, organizational structure etc.), the same are required to be communicated to the NBA, with an appropriate explanatory note.

 Copies of the Report of Chairman of the Visiting Team and Evaluators' reports in respect of the above programmes are enclosed.

If the Institute is not satisfied with the decision of NBA, it may appeal within thirty days of receipt
of this communication giving reasons for the same and by paying the requisite fee.

Yours faithfully, (Dr. Anil Kumar Nassa) Member Secretary

Encls: 1. Copy of Report of Chairman of the Visiting Team. 2. Copies of Expert Reports of the Visiting Team.

Copy to:

- 1. The Principal Secretary (Higher Education), Government of Telangana, D Block, Secretariat Building, Hyderabad- 500022 Telangana
- 2. The Director of Technical Education, State Board of Technical Education and Training Govt. of Telangana, 7th Floor, B.R.K.R. Bhavan Tankbund Road, Saifabad Hyderabad- 500 063, Telangana

3. Accreditation File

4. Master Accreditation file of the State.

Value Added Courses Offered:

- 1. Selection of nanomaterials for energy systems (VAC 01)
- 2. Carbon nanostructures preparation and its applications (VAC 02)
- 3. Analytical characterization techniques (VAC 03)
- 4. Bio-inspired nanostructures for textile applications (VAC 04)
- 5. Bio-inspired nanostructures for textile applications (VAC 05)
- 6. Analytical characterization techniques (VAC 06)

Mentor-Mentee Details:

S.NO	Mentor name	No. of mentee
1	Dr.CH. Shilpa Chakra	7
2	Dr. K.Venkateswara Rao	5



Date: 27-12-2016

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	20
Dr.CH Shilpa Chakra	Assistant Professor of NanoTechnology & BoS Chairperson i/c for Nanotechnology	B.Tech.,M.Tech., Ph.D	7
Mr.D.Rakesh	Assistant Professor (Contract)	B.Tech.,M.Tech	7

Students Pass Percentage: 67%

Full time Research Scholars:

S.N	Name of the Full-	Type of	Name of the supervisor	Research
	Time Research	Fellowship		area
	scholar			
1	Dayakar T	UGC-RGNF	Dr.K.Venkateswara Rao	Bio
				Sensors
2	Solleti Goutham	DST JRF/SRF	Dr.K.Venkateswara Rao	Gas
				sensors
3	B.Geeta Rani	Research	Dr.K.Venkateswara Rao	Gas
		Assistantship		sensors
		(RA)		

Part-time Scholars

S.N	Name of the	Name of the supervisor	Research area
	Research scholar		
1	V.Sesha Sai Kumar	Dr. K Venkateswara Rao	Nanofluids
2	Ramasubba Reddy P	Dr. K Venkateswara Rao	Ballistic Behaviour of
			Polymer Composites

Teacher Awards/Recognitions:

Dr. K. Venkateswara Rao :

- 1. Raman Fellowship for post doctoral research from (2016-17)
- 2. Awarded as ITAP from Tutors Pride (2017-18)
- Awarded as Best teacher from Telangana state government from Higher education department, Govt of India (2017-18)



No Paper publications: 07

No of Workshop/Conferences/seminars Attended:12

No of Books published: 03

MoU Activities :

- 1. Nanospan India pvt ltd (Five Years)
- 2. PFS Research Pvt Ltd, Hyderabad (One Year)

Research Collaborations:

Dr. Ch. Shilpa Chakra :

- 1. Nanospan India pvt ltd
- 2. VNR Vignana Jyothi Institute of Engineering and Technology

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 students placed : 10

No of Student progression to higher education: 02

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

Laboratories:

Characterization -I Lab

S. No.	Name of the Major Equipment	Purpose/Usage
1	Atomic Force Microscope	Academics & Research
	-	
2	TGA/DSC/DTA	Academics & Research
3	UV Spectroscopy	Academics & Research
4	Spin coating,	Academics & Research
5	Spray Pyrolysis	Academics & Research
6	Ball Mill	Academics & Research
7	Mini CVD	Academics & Research
8	Thin Film Unit	Academics & Research





Characterization - II Lab

S. No.	Name of the Major Equipment	Purpose/Usage
1	XRD	Academics & Research
2	Particle Size Analyzer	Academics & Research
3	Micro Balance	Academics & Research
4	Digital Microscope	Research

Industrial visit



S.NO	Batch	Name of the Industry	Date of visit
1	2017-18	ARCI	25-01-2018



Abroad visits by faculty:

Name of the Faculty	Country Visited	Purpose	Period	Year	Fundi ng Agen cy
Dr. K. Venkateswara Rao	Johns Hopkins Medicine, USA	Raman- Post Doctoral Fellowship	One Year	2016	UGC
Dr. K. Venkateswara Rao	University of Louisville-USA	Research	30 Days	2016	UGC
Dr. K. Venkateswara Rao	Gannon university	Research	3Days	2017	UGC
Dr. K. Venkateswara Rao	Pennsylvania State University	Research	3Days	2017	UGC



Research Outcomes:

- Center for Nano science and technology, is one and only center in Telangana state universities which offers multidisciplinary M.Tech Nano technology (NBA accredited) and Ph.D programs that was supported by DST Nano mission in the first five years.
- CNST department has so far established higher research groundwork by publishing around 300 international journals with high impact factors and four patents have been filed. Incubation centers have been also been created with different industries like Nanospan, PFS wherein the industries are the byproduct of our alumni. Some of R&D projects that have been undertaking by the department were on microbiofilm gas sensors, non-enzymatic glucose sensor, energy storage, seed germination and so on. CNST department also encourages ecofriendly green nanotechnology initiatives.
- One of the Faculty Dr. K.Venkateswara Rao was Awarded a prestigious Indo-US Project, Called Raman Post doctoral Fellowship for 12 months In Johns Hopkins Medicine on cancer nano technology research. He was also given outstanding contribution in reviewing 2017 in two Elsevier journals namely 1. bulletin of materials research, 2. Sensors & actuator B-Chemical. He was also one of best teacher awardee from Telangana state in 2017

Research Innovations of the Centre

- Under R-15 CBCS, 3 electives were introduced based on the Centre's R& D activities and Faculty member's expertise.
- M.Tech Students are strongly motivated to publish at least one article in peer reviewed journal and one conference.
- > Entered into MoU with Nano Span India Pvt Ltd
- > Start up PFS Research private limited has collaborated with an MOU
- > MoU with Innoscentia AB, Sweden (Discussions going to be finalised)
- > Preparation of Nanoparticles using kitchen waste
- > Efficiency of the solar cell is increased using organic dyes, NED batteries
- > Developed cost effective gas sensor using bio-nanomaterials
- > Molecular level Water purification using Nanomaterials like Graphene Oxide
- > Thermal conductivity modifications
- > Conductive Ink: collaboration with Nano span
- > Super-capacitor: collaboration with Nano span under EDC

JNTU-H researchers develop LPG sensor to detect dangerous leaks

TIMES NEWS NETWORK

Hyderabad: Research scholars at the Jawaharlal Nehru Dechnological University Hyderabad (JNTUH) have deve loped an LPG sensor that will

The team of three researchers used . patent for the product, after which

will help in early detection of mercannov once researches soes anatotechnologi obeelogi the search which will detect gas isals and con-vert kintoelectrical signals. The researches have now applied for a continue of the there researches apart from gas and Devarial Sunthals Kumar

Isped in LPG sense that will hely people doort gas lakage individificate seitate. After haflerkine out the LPG lask is stram Nagre. Kramas Sintan Nagre. Kramas Han Under Her Berner Sintan Nagre. Kramas Sintan Nagre. Kramas Sintan Nagre. Sintan Nagre. Kramas Sintan Nagre. Sintan Nagre. Kramas Sintan Nagre. Sintan Nagre. Sintan Nagre. Kramas Sintan Nagre. Sintan Nagre. Sintan Nagre. Kramas Sintan Nagre. Sin





Best Practices:

- Evaluation & Monitoring of learning Capabilities
- > Involvement in R&D projects, seminars & conferences
- > Visits to Industries, R&D laboratories and Field studies
- > To Make the Department as a Centre of Excellence in R&D Activities.
- > M.Tech. students are encouraged to do projects (Lab curriculum) in the center and publish in a peer reviewed journals.

Societal outreach activities:

Conducted Lab Sessions for B.Tech Students (MEMNT, JNTUHCES)



Clean and Green Campus (Swachh Bharat)

≻Haritha Haram



> Orphanage Visits



> Visiting Govt. & Residential schools to motivate students towards Science & Technology