Placement Brochure 2017-2018

Nanoscience & Technology

CONTENT

About the programme 1
Student Profile 2
Curriculum 3
Laboratory Facilities..... 4
Research. 5
Projects. 6
Department Contact Information..... 7

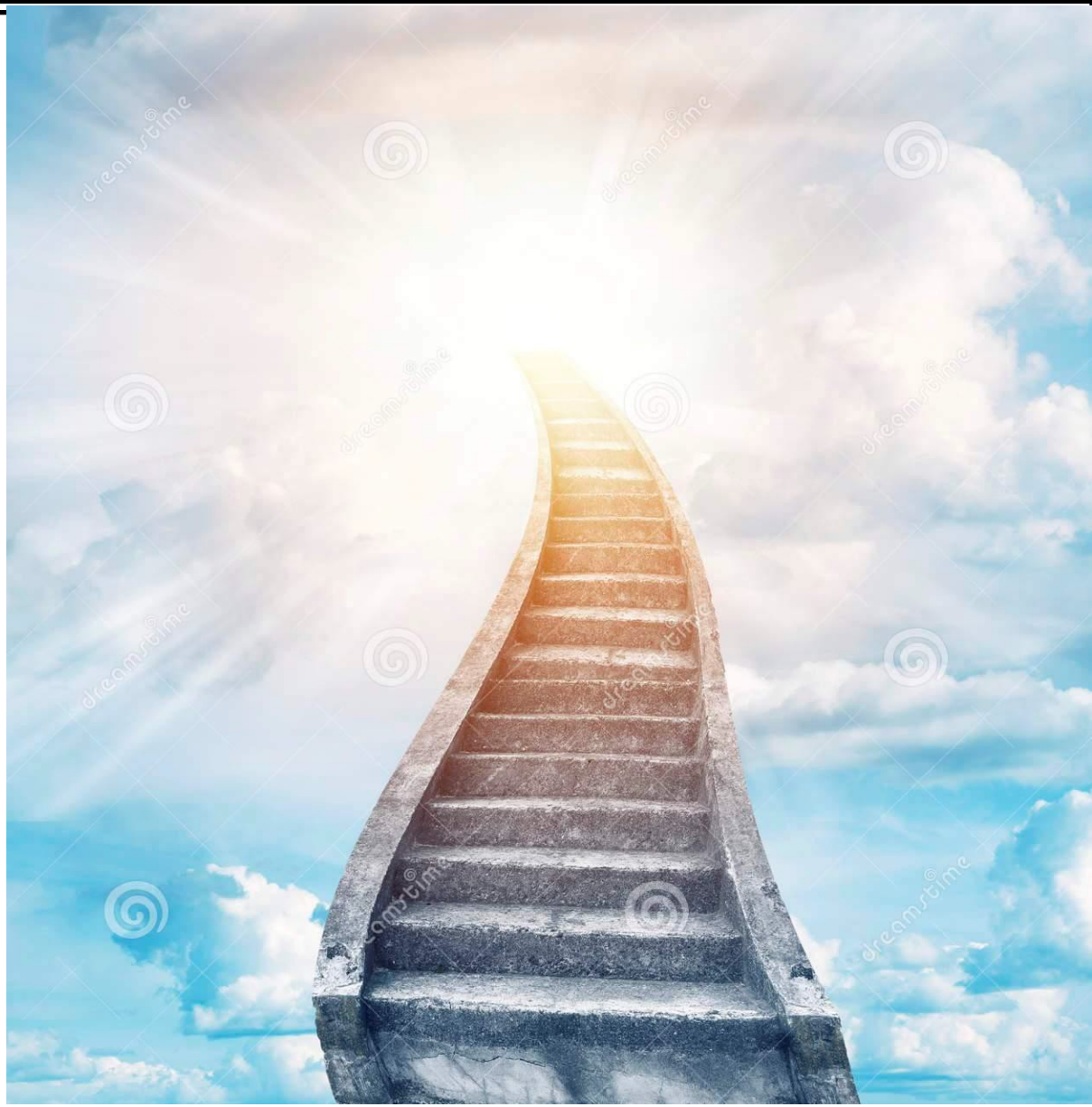
ABOUT THE PROGRAMME

The programme has been started in July 2012 with the objective to develop innovative, focused and high quality human resource to address the current challenges faced by technology, society and humanity. This multidisciplinary programme aims to train students graduated in various science and engineering streams like electronics, mechanical, materials science, chemistry or physics, in the emerging and futuristic field of nanoscience and its application.

Develop an awareness of a diverse range of nanoscience and nanotechnology application areas through the medium of seminars delivered by national and international leaders in the field.

Develop generic problem solving and team working skills in an interdisciplinary environment.

Engage in the planning, execution and written/oral presentation of a substantial, research project.



Student Profile

The admissions to M.Tech in Nanoscience & Technology programme is based on their performance in the national level GATE (Graduate Aptitude Test in Engineering) examination and in the interview conducted in the department. The students are chosen from diverse engineering backgrounds viz., mechanical engineering, electrical engineering, electronics and communication engineering and basic sciences viz., physics, chemistry.

Sl.no.	Name	Background	Project Title	Supervisor
1.	Dewanand Pandit	Mechanical Engg.	Modification of gear wheel surface strength and wearing by graphene-metal coating	Dr. Manoranjan Kar
2.	Harsh Ranjan	Electrical & Electronics Engg.	Electronic cooling by Graphene and its analogues	Dr. Prashant Kumar
3.	kM Kavita Vishwakarma	Electronics & Communication Engg.	Electronic devices based on graphene and its analogues	Dr. Prashant Kumar
4.	Puli Sunny Babu	Electronics & Communication Engg.	Oxides for Renewable Energy Applications	Dr. A. K. Thakur
5.	Prakhar Verma	Electrical & Electronics Engg.	Nanoscale property measurements of thin films for device application using scanning probe microscope (AFM/STM)	Dr. Alpana Nayak
6.	Rajashik Paul	Physics MSc	Efficient nanomaterials for enhancing Raman effect	Dr. V R Dantham
7.	Rishabh Kishore	Electronics & Communication Engg.	Atomic switch using scanning probe microscopy	Dr. Alpana Nayak
8.	Shubrojit Mishra	Electronics & Communication Engg.	Piezoelectric nanogenerator for flexible electronic applications	Dr. Manoranjan Kar

Curriculum

The program is designed to provide in-depth knowledge in the fundamental aspects of nanoscience and technology with an emphasis on synthesis, visualization and manipulation at the nanoscale. It is expected to prepare students for careers in nanomaterials and nanoelectronics industries. The experts from industry and academia (both within India as well as abroad) are frequently invited as guest lecturers for developing a broader perspective on the subject keeping in mind the latest industry requirements.

The first two semesters consist of 6 courses each and the remaining two semesters consist of thesis work. Out of these 12 courses, there are 6 elective courses and 4 compulsory courses and 2 laboratory courses. Based on the interests of the students, electives are chosen, which could give them a head start in their thesis work and further research.

Core Courses

- Concepts of Nanomaterials
- Analytical Techniques
- Nanoscale measurement and analysis laboratory
- Design and Synthesis of Nanomaterials
- Nanoscale Devices
- Nanomaterials Synthesis and Device Fabrication Laboratory

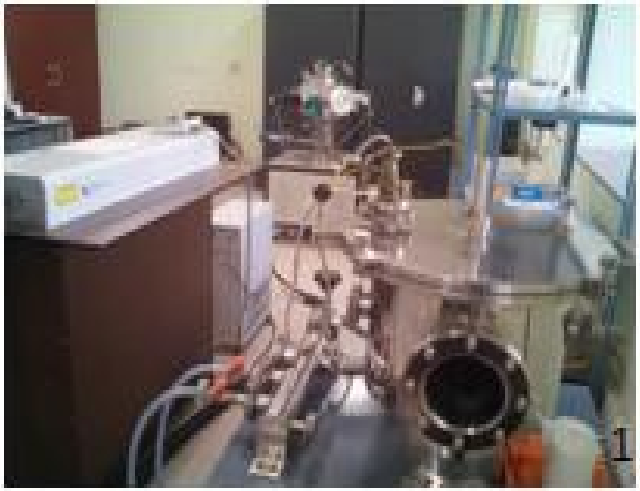
Elective Courses

- Thin Film Technology
- Nanomaterials for Solar Energy and Photovoltaics
- Nanophotonics
- Computational Nanoscience
- Nanoelectronics
- Magnetism at Nanoscale
- MEMS and NEMS

Equipments Familiarized with:

XRD, AFM,STM, PQMS, SEM,
UV –Visible Spectroscopy, Flourimeter,
Thermal Evaporator, PVD, Solar Simulator,
Sputtering, Spin Coating etc.

Laboratory Facilities



1. Thin Film Lab: PLD, Vacuum Coating Unit, Spin Coating, Dip Coating, LB coating unit
2. Electrical Characterization Lab: Function Generator, Magneto-electric Set-up, Vector Network Analyzer, Impedance Analyzer, Ellipsometer
3. Liquid Nitrogen Lab: Liquid Nitrogen Plant
4. Material Characterization Lab: Raman, UV-Vis Spectrophotometer, PL, Solar Simulator, DSC-TGA
5. XRD Lab: X-ray Diffractometer
6. SEM Lab: Field Emission Scanning electron microscope

Research

The prime motive of research in the department is to enhance knowledge, technology, and ideas for the betterment of the society. The department is intensively carrying out original research in the fields of nanoscience and technology .Some of the projects that are undertaken by previous batch students.

Sl. No.	Name	Project Title
1.	Sagnik Ghosh	Semiconductor process optimization and integration for the elimination of deep trench isolation crack issue in high voltage device.
2.	Nishid Ranjan	Oxide hetrostructure for solar cell application
3.	Manish Pandey	Fabrication of pentacene based organic field effect transistor.
4.	Puchakatla Venkat Subbaiah	Memristor: Metal oxide Metal configurations for resistive switching applications.
5.	Rabichandra Pandey	Fabrication of grating structured interference Lithography Technique.
6.	Pradeep Kumar Leuaa	Hierarchically nanostructure Tin Sulphide as an electrode material for Li- ion Batteries & Super capacitors.
7.	Arun Singh Chauhan	Tuning of magnetic and electric properties in complex oxide thin film deposited by PLD.
8.	Rinkal K.Kanani	Activated carbon from shells of roasted Pistachio for cryopump application.
9.	Sharmistha Chatterjee	Synthesis and characterization of efficient nanoplasmonic antennas for improving the sensitivity of a whispering gallery made biosensor.
10.	Anirban Chakarborty	Quantum Dot-DNA conjugate for potential application in Photodynamic Therapy.

Projects

The faculty of NST programme in collaboration with the faculty members from other departments has been able to attract significant sponsored research activity :

Project Title	Principal Investigator	Funding Agency
Development of Indigenous Technology for High Energy Density lipo Battery for low temperature application	Dr. A. K. Thakur	RCI, DRDO
Graphene and other 2D materials based spintronics and topological insulators	Dr. Jayakumar Balakrishnan	DST (INSPIRE Faculty Scheme)
Spin transport in graphene/LSMO heterostructures	Dr. Jayakumar Balakrishnan	DST Nanomission
Real time detection and sizing of single protein molecule using a nanoplasmonic-photonic hybrid microresonator	Dr. Venkata Ramanaiah Dantham	SERB (Extra Mural Research Funding)

Department Contact Information

Head of Department:

Dr. Utpal Roy
Associate Professor
Ph: +91-612-255 2007
Fax: +91-612-227 7383
uroy@iitp.ac.in

Departmental Details:

Nanoscience & Technology,
School of Basic Science,
IIT Patna,
Bihta, Patna, Bihar-801103
Telephone:+91-612-302 8326

Placement Coordinators:

Mr. Prakhar Verma
Email: prakhar.mtnt16@iitp.ac.in
Contact no. 9717592052

Mr. Puli Sunny Babu
Email: puli.mtnt16@iitp.ac.in
Contact no. 7032697909