National Forensic Sciences University
Knowledge | Wisdom | Fulfilment
An Institution of National Importance
(Ministry of Home Affairs, Government of India)

School of Engineering and Technology

Admission Information Brochure

M.Sc. Forensic Nanotechnology

With specialization in (i) Nanoscience and Nanotechnology
(ii) Nanobiotechnology

About the Program

The M.Sc. Forensic Nanotechnology programme has been designed in such a way that, it will provide fundamental knowledge on Nanotechnology as well as its wide applications in different branches including Forensic Science, Biotechnology, Drug Delivery, Bio-Imaging, Catalysis, Environmental Science and Energy Harvesting. This is a unique and highly specialized research-oriented masters programs where students will gain theoretical knowledge along with in hand practice of latest nano-analytical and nano-imaging techniques and will perform innovative research projects with aim to tackle many upcoming challenges faced by humanity in the 21st century. The students will be provided internship-driven training at various industrial and academic institutions and will get opportunity in institutional consultancy works to become familiar with the real-world challenges. Using all the tools in chemistry-biology such as nanomaterial synthesis and chemical and physical characterization methods, this broad disciplinary master's programme aims at deepening the understanding of materials properties in order to design and develop the materials of tomorrow. Currently, the program offers two specialization namely; **(i) Nanoscience and Nanotechnology (ii) Nanobiotechnology**

Specialization in Nanoscience and Nanotechnology

Nanoscience and Nanotechnology enable students and researchers to apply their knowledge to develop new functional nanomaterials, nanodevices/nanosensors fabrication, characterization and manipulation to explore the novel properties and shape the future world.

Specialization in Nanobiotechnology

Nanobiotechnology employ the knowledge and techniques of biology to work in conjunction with genetics, molecular biology and cellular processes in order to develop nano-products and services that find applications in forensic science, Pharmacy, healthcare, agriculture and the environment.

Advanced characterization facilities

The laboratories of School of Engineering and Technology is well equipped with sophisticated instruments.

- Field Emission Scanning Electron Microscope (FESEM)
- Raman Microscope
- Atomic Force Microscope (AFM)
- Powder X-ray diffractometer (XRD)
- Particle Size & Zeta Potential Analyzer
- Energy Dispersive X-ray Fluorescence (EDXRF)
- Time-correlated single photon counting (TCSPC)
- Differential Scanning Calorimetry (DSC)
- Gel electrophoresis
- ELISA Reader, PCR, RT-PCR
- Gel-DOC system
- Automated Smart-HPLC system/Isocratic HPLC
- UV Visible-NIR spectrophotometer
- Spectrofluorimetric
- FT-IR with image microscope
- GC-MS, LC/MS/MS, ICP-OES
- Fluorescence microscope
- Brookfield Viscometer

Nanomaterials processing facilities

The solid, liquid, and gas-phase synthesis and processing facilities for nanomaterials are available at our school.

- ⇒ Thermal chemical vapor deposition
- ⇒ Refrigerated high-speed centrifuge
- ⇒ Electrospinning system for nanofiber
- ⇒ Parallel synthesizer
- ⇒ Microwave/Ultrasonic/UV synthesizer
- ⇒ Spin coating unit for thin film
- ⇒ High-temperature heat treatment furnaces
- ⇒ Lyophilizer
- ⇒ Rotary evaporators
- ⇒ Probe sonicators
- ⇒ Microwave oven
- ⇒ Rotary shakers
- ⇒ Microwave digestion system
- ⇒ Planetary Ball-Mill
- ⇒ High-speed stirrer

Program Structure

The two years masters degree programme of M.Sc. Forensic Nanotechnology (specialization in (i) Nanoscience and Nanotechnology (ii) Nanobiotechnology is blended in such a way that students are appraised regarding novel phenomenon of nanotechnology, the synthesis, properties, characterization of nanomaterials as well as applications of nanotechnology in various fields.

The students performance is continuously assessed through assignments, periodic tests, quizzes, participation in workshops and seminars, industrial visit, expert lectures, project work in addition to mid semester and semester end examination.

Semester I

- Forensic Science and Law
- Fundamentals of Nanotechnology / Fundamentals of Nanobiotechnology
- Advanced Analytical Methods-I
- Synthesis and Properties of Nanostructures
- Nanotechnology in Forensic Investigation / Bionanomaterials
- Laboratory Practical -I

Semester II

- Advanced Analytical Methods-II
- Nanostructure: Processing and Characterization
- Nanocomposite Materials and Applications / Bio Functionalization and Self Assembly of Nanomaterials
- Nano Self-Assembly Systems / Nanomedicine and Nanotoxicology
- Elective-I
- Laboratory Practical -II

Semester III

- Nanosensors and Nanodevices/Fermentation and Bionanoseparation Technology
- Nanotechnology in Energy Conversion and Catalysis / Nanobioengineering
- Research Methodology and Statistics
- Elective -II
- Minor Project
- Laboratory Practical -III

Semester IV

- Major Project

Elective Subjects

1. Forensic Nuclear Nanotechnology
2. Nanotechnology in Textile
3. Carbon Nanostructures and Applications
4. Forensic Toxicology
5. Bio Interfacial Strategies and Nano Fabrications
6. Nanocomposites Materials for Food Packaging
7. Green Nanotechnology
8. Industrial Nanotechnology
9. Nanotechnology: Human Health and the Environment Aspects
10. Nanotechnology in Agriculture
11. Pharmaceutical Nanotechnology
12. Nanotechnology in Defense
13. Environmental Nanotechnology

Opportunities and Placements

Nanotechnology is the one of the booming field which have revolutionised the current technology. The Indian government has already started Nanoscience and Nanotechnology initiatives program under Department of Science and Technology, funding various institutes and research laboratories to promote research and industrial applications of nanotechnology. The students of MSc Forensic Nanotechnology program will have good job opportunities in forensics, defense, environment, food, agriculture, genetics, space research, pharmaceutical, medicine, biotechnology, and so on. Alumni of this course are now working for companies including Troikaa Pharmaceuticals, Piramal Life Sciences Ltd., Amneal Pharmaceuticals, Zydus Cadila Healthcare ltd, TCS, Accuprec Research Labs Pvt Ltd, Sahajanand Laser Technology Ltd. etc. The students are also opted for research in India and abroad in national laboratories, defense laboratory, IITs and universities.

Faculty Members

Dr. Prasenjit Maity (M.Sc., Ph. D.)

Associate Professor

Dr. Harshad Patel (M.Sc., Ph. D.)

Assistant Professor

Dr. A.V.R. Krishna Rao (M.Tech., Ph.D.)

Assistant Professor

Dr. Pranav Yogeshbhai Dave, (M.Tech., Ph.D.)

Teaching & Research Assistant

Mr. Jigar Raval, (M.S., Ph.D. Pursuing)

Teaching & Research Assistant

Contact Details:

For more details please visit website: https://www.nfsu.ac.in/m-sc-forensic-nanotechnology

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