

No. 9(5)/2024-INST

Dated: 18.09.2024

Ph.D. PROGRAM - JANUARY 2025 SESSION

[Institute of Nano Science and Technology](#) (INST), Mohali invites applications from prospective candidates for admission into its Ph. D. Program in applied to various areas related to physical sciences, chemical science, biological sciences, pharma and agri sciences connected to nanoscience and nanotechnology for the session beginning in January 2025.

Students with an independent source of fellowship, for example, CSIR/UGC-JRF fellow etc. should apply. Selected students will be enrolled in the Ph. D. program of the Indian Institute of Science Education and Research (IISER), Mohali, and the Ph. D. degree will be awarded by IISER, Mohali.

If you have any queries, email apply@inst.ac.in

The major ongoing research areas at INST are given at the end of this document.

a) ELIGIBILITY

- M. Sc. or M. Pharm. or M. Tech. in Basic or Applied Sciences, Engineering or related areas. Students who have appeared for the final year/semester examinations are also eligible, provided that the degree will be granted by the time of joining.
- Qualified at least one national examination out of CSIR/UGC-NET, ICMR-JRF, DBT-JRF or Project-Funded (as per INST rules).
- Age limit: As per the guidelines of CSIR-UGC and DST.
- **DST INSPIRE** may apply however any selection of such candidate will be on adhoc basis subject to successful activation of inspire fellowship.

b) APPLICATION & SELECTION PROCEDURE

1. A hard copy of application (affixing a recent passport size photograph) along with the self-attested copy of certificates providing age, educational qualifications, experience (if any) and reservation category should be sent to "The Director, Institute of Nano Science and Technology, Knowledge City, Sector 81, Mohali 140306 (Punjab). The envelope containing the application form should be super scribed as "Application for the Ph. D. Program – January 2025". **Applicants must also submit an online synopsis** : <https://forms.gle/ktgGYhtbSdEjTzmc7>
2. Eligible candidates will be shortlisted for interview and the date and mode of interview will be communicated to the email address provided by candidate. The list of shortlisted candidates will also be uploaded on INST website.
3. No TA/DA will be paid for attending the interview.
4. After the interview, the list of candidates selected for Ph. D. will be uploaded on INST website and the candidates will be intimated by email.
5. Selection of students shall be done as per the provisions of The Central Educational Institutions (Reservation in Admission) Act, 2006 and amendments made thereto.
6. The candidates are advised to visit INST website frequently to track the latest developments.
7. Number of students required for admission SC/ST (13), OBC (15), EWS (6), and GEN (29).

c) APPLICATION FEES

- **Rs.590/-**(per unit) for General, OBC and EWS candidates, and **Rs.295/-**(per unit) for SC, ST and PH candidates.
- Application fee may be transferred online to the bank account of INST noted below. Full name of the applicant shall be mentioned as the purpose of transaction. The details of the online transaction should be attached along with the application.

Account Name: Director, INST Mohali
IFS code: CNRB0002919

Account number: 2452201001102

Bank: Canara Bank, SECTOR-64, PHASE 10, MOHALI-160062

d) LAST DATE

- The duly filled applications along with the supporting documents should reach INST through Registered/ Speed Post/ Courier/ By Hand on or before **25th Oct 2024**.
- Applications received after the last date shall not be entertained in any case.

Chemical Biology

Cancer Nanomedicine (Domain: Biological & Pharmaceutical Sciences)

- Epigenetic based
- Hyperthermia based
- Photo-thermal therapy
- Photo-therapy
- Combinatorial nanomedicine approach

Nano-therapeutics (Domain: Biological & Pharmaceutical Sciences)

- Infectious diseases: tuberculosis, leishmaniasis
- Neurodegenerative diseases: Alzheimer's disease, Parkinsonism
- Lifestyle diseases: rheumatoid arthritis, osteoarthritis
- Autoimmune disease: ulcerative colitis

Biomimetic and Tissue Engineering (Domain: : Biological & Chemical Sciences)

- Regenerative nanomedicine
- Stem cell nanomedicine
- Supramolecular nanomaterial scaffolds
- Smart and stimuli responsive hydrogels
- Hybrid organic-inorganic nanomaterials

Biomolecular Phenomenon at Nanoscale (Domain: : Chemical & Biological Sciences)

- Disease mechanism
- Self-assembling biopolymers
- Nano-confinements
- Biological nano-machines
- Bio photonics & chiro-optics

Nano-diagnostic (Domain: : Chemical & Biological Sciences)

- Biosensors: SERS, electrochemical or fluorescence based techniques
- Theranostics: biomaterials for theranostics

Agri-nanotechnology (Domain: Biological, Chemical & Agri Sciences)

- Nano-fertilizers
- Nano-pesticides

Nano-toxicology (Domain: Biological & Pharmaceutical Sciences)

- Cell and tissue toxicity
- Nanomaterial toxicity
- Developmental, neurological, behavioural nano-toxicity

Energy & Environment

Inorganic & Materials Chemistry (Domain: Inorganic Chemistry)

- Electrochemistry (fuel cells, batteries & supercapacitors)
- Energy storage & conversion
- Framework materials (COF & MOF)
- Photocatalysis (water splitting & CO₂ reduction)
- Solar cells (perovskites, quantum dots & dye sensitized solar cells)
- Solid state chemistry
- X-ray scattering
- Micro/nano-motors

Organic & Polymer Chemistry (Domain: Organic Chemistry)

- Biomaterials & drug delivery
- Chemosensors
- Flexible optoelectronics
- Luminescent materials
- Catalysis (organic transformations, photocatalysis, biomass conversion)
- Supramolecular Micropumps
- Synthetic methodology
- Small molecule & polymer synthesis
- Stimuli-responsive supramolecular materials

Spectroscopy & Physical Chemistry (Domain: Physical Chemistry)

- Biosensing
- Device fabrication
- Luminescence spectroscopy
- Nanophotonics
- Single molecule spectroscopy
- Ultrafast spectroscopy

Environmental Chemistry (Domain: Organic, Inorganic and Physical Chemistry)

- CO₂ sequestration & N₂ fixation
- Microfluidics based sensing of pollutants
- Sensing
- Waste management
- Water & air purification

Quantum Materials & Devices

Experimental condensed matter Physics, Material and Device Physics (Domain: Physical Sciences)

- Low dimensional materials and artificial superstructures
- Nanoscale piezo, ferro and pyro-electricity
- Photovoltaics
- Micro and nano structured device
- Nano devices and sensors
- Spintronics
- Quantum materials, Topological physics
- Organic-inorganic hybrid nanostructured devices, self-powered electronics, sensors and actuators
- Flow fabrication of nanostructures for light driven properties
- Microfluidics for sensing and delivery
- Renewable energy storage & transfer devices
- Green H₂ production

Computational Nanoscience (Domain: Physical Sciences)

- Theoretical condensed matter physics
- Exploiting piezoelectricity, electronic charge, spin and valley degrees of freedom at the nanoscale for next-generation electronics
- Nanomaterials and their interfaces for power conversion: e.g., photovoltaics, photocatalysis, sensors
- Designing of spin-interfaces and spintronics materials
- Single molecule magnets and molecular magnetism

Computational Chemistry (Domain: Chemical and Physical Sciences)

- Electron transfer in proteins & enzymatic chemical reactions
- Electron transport at molecular nano-junctions

Computational Biology and Biophysics (Domain: Biological and Physical Sciences)

- Molecular Dynamics Simulations of Protein and Protein-Ligand Interactions
- Anti-malarial drug activities and drug designing
- Regulation of enzymatic activities of CBS enzymes