

No. 9(1)/2021-INST

Dated 3rd September 2021

Ph.D. PROGRAM - JANUARY 2022 SESSION

Institute of Nano Science and Technology (INST), Mohali invites applications from prospective candidates for admission into its Ph. D. Program in several areas of nanoscience and nanotechnology for the session beginning in January 2022. Selected students will be provided fellowship as per the norms of INST and Government of India. **Students with an independent source of fellowship, such as CSIR/UGC-JRF, are also encouraged to apply.** Selected students will be enrolled in the Ph. D. program of Indian Institute of Science Education and Research (IISER), Mohali and the Ph. D. degree will be awarded by IISER, Mohali.

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 GATE, CSIR/UGC-NET, JEST, JGEEBILS (TIFR/ NCBS), ICMR-JRF, DBT-JRF, DST-INSPIRE or GPAT.
- Age limit: As per the guidelines of CSIR-UGC and DST.

b) APPLICATION & SELECTION PROCEDURE

- Candidates must submit application in the prescribed format available at <https://inst.ac.in/careers>.
- In addition to the above application, the candidates are required to submit an online synopsis ([click here: https://docs.google.com/forms/d/e/1FAIpQLSd-LesA-Efu4QDsn0oqa62ev4azldHEICAKwBp0c4CNKBGM6Q/viewform?usp=sf_link](https://docs.google.com/forms/d/e/1FAIpQLSd-LesA-Efu4QDsn0oqa62ev4azldHEICAKwBp0c4CNKBGM6Q/viewform?usp=sf_link)).
- A hard copy of application (affixing a recent passport size photograph) along with the self-attested copy of certificates proving 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 2022".
- 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.
- Ph. D. interviews will be conducted online and the link for the same will be provided prior to the interview. In case the interviews are conducted in person, the candidates called for interview will be paid sleeper class rail fare or non-AC bus fare from the place of residence to INST and back on production of ticket.
- 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.
- The candidate are advised to visit INST website frequently to track the latest developments.
- Selection of students shall be done as per the provisions of The Central Educational Institutions (Reservation in Admission) Act, 2006 and amendments made thereto.

c) APPLICATION FEES

- **Rs.590/-** for General, OBC and EWS candidates, and **Rs.295/-** for SC, ST and PH candidates.
- Application fees 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: CNRB0002452

Account number: 2452201001102

Bank: Canara Bank, Sector 34A, Chandigarh 160022

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 **04th October 2021**.
- Applications received after the last date shall not be entertained in any case.

Chemical Biology	Energy & Environment	Quantum Materials & Devices
<p><i>Cancer Nanomedicine</i></p> <ul style="list-style-type: none"> ▪ Epigenetic based ▪ Hyperthermia based ▪ Photo-thermal therapy ▪ Photo-therapy ▪ Combinatorial nanomedicine approach <p><i>Nano-therapeutics</i></p> <ul style="list-style-type: none"> ▪ Infectious diseases: tuberculosis, leishmaniosis ▪ Neurodegenerative diseases: Alzheimer's disease, Parkinsonism ▪ Lifestyle diseases: rheumatoid arthritis, osteoarthritis ▪ Autoimmune disease: ulcerative colitis <p><i>Bio-mimetic and Tissue Engineering</i></p> <ul style="list-style-type: none"> ▪ Regenerative nanomedicine ▪ Stem cell nanomedicine ▪ Supramolecular nanomaterial scaffolds ▪ Smart hydrogels ▪ Hybrid organic-inorganic nanomaterials <p><i>Biomolecular Phenomenon at Nanoscale</i></p> <ul style="list-style-type: none"> ▪ Disease mechanism ▪ Self-assembling bio-nanomaterials ▪ Nano-confinements ▪ Biological nano-machines <p><i>Nano-diagnostic</i></p> <ul style="list-style-type: none"> ▪ Biosensors: SERS, electrochemical or fluorescence based techniques ▪ Theranostics: biomaterials for theranostics <p><i>Agri-nanotechnology</i></p> <ul style="list-style-type: none"> ▪ Nano-fertilizers ▪ Nano-pesticides <p><i>Nano-toxicology</i></p> <ul style="list-style-type: none"> ▪ Cell and tissue toxicity ▪ Nanomaterial toxicity ▪ Developmental, neurological, behavioural nano-toxicity 	<p><i>Inorganic & Materials Chemistry</i></p> <ul style="list-style-type: none"> ▪ Electrochemistry (Fuel cells, Batteries & Supercapacitors) ▪ Photocatalysis (Water splitting & CO₂ reduction) ▪ Solid state chemistry ▪ Energy storage & conversion ▪ Solar cells (Perovskites, Quantum dots & Dye sensitized solar cells) ▪ Framework materials (COF & MOF) <p><i>Organic & Polymer Chemistry</i></p> <ul style="list-style-type: none"> ▪ Small molecule & polymer synthesis ▪ Catalysis ▪ Supramolecular materials ▪ Luminescent materials ▪ Chemosensors ▪ Biomaterials ▪ Stimuli-responsive materials ▪ Nanomotors & Micropumps <p><i>Spectroscopy & Physical Chemistry</i></p> <ul style="list-style-type: none"> ▪ Ultrafast spectroscopy ▪ Single molecule spectroscopy ▪ Nanophotonics ▪ Biosensing ▪ Luminescence spectroscopy ▪ Device fabrication <p><i>Environmental Chemistry</i></p> <ul style="list-style-type: none"> ▪ Water & air purification ▪ Sensing ▪ CO₂ sequestration & N₂ fixation ▪ Waste management ▪ Microfluidics based sensing of pollutants <p><i>Computational Chemistry</i></p> <ul style="list-style-type: none"> ▪ Electron transfer in proteins & enzymatic chemical reactions ▪ Electron transport at molecular nano-junctions 	<p><i>Experimental aspects of Material and Device Physics</i></p> <ul style="list-style-type: none"> ▪ Low dimensional materials and artificial superstructures ▪ Nanoscale piezo, ferro and pyro-electricity ▪ Photovoltaics ▪ Micro and nano structured device ▪ Nano devices and sensors ▪ Spintronics ▪ Organic-inorganic hybrid nanostructured devices, self-powered electronics, sensors and actuators ▪ Flow fabrication of nanostructures for light driven properties ▪ Microfluidics for sensing and delivery ▪ Physics in Nanodimension objects <p><i>Computational Nanoscience</i></p> <ul style="list-style-type: none"> ▪ 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