

NATIONAL INSTITUTE OF TECHNOLOGY SILCHAR
SILCHAR – 788010, ASSAM, INDIA
Admission into Ph.D. Programme for the session Jan to June 2021

No. Dean (RC)/105/2021/1

Date: 03/12/2020

Applications are invited for admission into **Ph.D programme under Group B category** in the following departments with the area / specializations as mentioned in the table for the session Jan to June 2021.

DEPARTMENT	SPECIALISATION
Civil Engineering	<ul style="list-style-type: none"> ➤ Hydrology, Water Resources Engineering, Optimization methods, Sediment transport / River Mechanics Water & Wastewater Engineering, Surface Water Hydrology, Sediment Transport, Climate change, River Modeling, hydrological modeling, groundwater Engineering , Climate change impact in DRF ➤ Transportation planning, Transportation Engineering, Traffic Engineering, Pavement Engineering ➤ Geotechnical Engineering, Shallow foundation, deep foundation, machine foundation, soil dynamics, soil stabilization, Application of probability and reliability theory in geotechnical engineering, Ground improvement and Geosynthetics ➤ Construction Materials & Structural Engineering, Earthquake Engineering, Vibroacoustics, Structural Dynamics and vibration control, Active Structural Acoustic Control (ASAC) ➤ Environmental Engineering
Mechanical Engineering	<ul style="list-style-type: none"> ➤ Renewable Energy, Aerodynamics, Combustion ➤ Micro machining, advance machining and manufacturing processes ➤ Mechanical Behaviour of FRP Laminated Composites ➤ Molecular Dynamics ➤ IC Engine, Bio fuel ➤ Analytical heat transfer , Heat transfer augmentation, Extended surface, Electronic cooling, Heat transfer through porous surface, Solar collector, Renewable energy , Optimization, CFD, Bioheat Transfer ➤ Internal Combustion Engines, Combustion Kinematics, Pollutant formation mechanism, Fuel Hybridization, Emission after treatment. ➤ Kinematic and Dynamic Modelling of the Robotic Manipulator, Parallel Manipulator and Nonlinear Control of Robotic Systems, Mechanism, Compliant Mechanism, Shape Memory alloy Smart Actuation ➤ Arc based surface modification, Hard surface coating, Laser material processing ➤ Welding and Corrosion ➤ Multibody Dynamics, Rotor dynamics, Vibration analysis, Vibration control ➤ Tribology, Nano-lubrication, Composite Materials, Surface Engineering and Coatings ➤ Additive Manufacturing; Topology Optimization. ➤ Thermal spray, MQL assisted machining, Abrasive machining, Coatings, Material Characterization
Electrical Engineering	<ul style="list-style-type: none"> ➤ Power and Energy Systems ➤ Renewable Energy ➤ Control Systems ➤ Power Electronics and Drives ➤ Instrumentation ➤ Microelectronics ➤ VLSI and Image processing

Electronics and Communication Engineering	<ul style="list-style-type: none"> ➤ Devices, Microelectronics And VLSI: Semiconductor Device And Modelling, Bio Sensor, Solid State Device Modeling And Simulation, Electronic Circuits, Nanoelectronics& Nanotechnology, Semiconductor Device And Modelling, VLSI Interconnects, Digital VLSI Design, Sensors, Stretchable Electronics, Machine Learning For Physical Design, Perovskite Solar Photovoltaics, Synthesis Of Nano-Particle And Application Of Nanotechnology, Analog Circuits, VLSI, VLSI Design, MEMS, MEMS-Piezoelectric Energy Harvesting, RF MEMS, Bio Sensor, Power Electronics. ➤ Signal Processing: Digital Signal Processing, Speech Processing, Image And Video Processing, Bio-Medical Signal Processing, Digital Image Processing, Medical Imaging, Embedded Systems, Machine Learning And Deep Learning, Advanced Driver-Assistance Systems (ADAS), Sentiment Analysis, Design Of Exoskeleton, Augmented Reality, Computer Vision, Image Processing, Machine Learning/Deep Learning Applications In Image Processing And Computer Vision, Pattern Recognition , Machine Learning And Deep Learning. ➤ Communication: Wireless Communications, 5G Communication Techniques, Cross-Layer Issues In Wireless Sensor Networks, Cooperative Wireless Communications, AI-Assisted Self-Sustainable Energy Harvesting Wireless Communication, Next Generation (5G+) Networks, Power Line Communications, Underwater Networks, Free-Space Optical Communications, And Green Communications, Cognitive Radio Networks, Cooperative Communications, Resource Sharing, RF-MAC And Energy Harvesting MAC Protocols, Target Channel Selection, MIMO And Massive MIMO Communications, mm-wave Communications, Cooperative MIMO Communications, NOMA, MIMO Communications, MIMO-OFDM Communications, Signal Processing For Communications, Antenna Communications, Efficient Scheduling Of Wireless Resources, and Various Aspects of all other Recent Forms Of Communications, Soft Computing Techniques in Communication and WSN, IoT, Signal Processing For Communications. ➤ Optical Communication: Optical Fiber Communication, Opto-Electronic Devices, III-V Semiconductors, Photonic Integrated Circuits, Biosensors. ➤ Antenna: Resonators for RF Applications, Metamaterial-Inspired Structures for Antenna Application, Active & Passive Microwave Devices, Microwave Imaging, Smart Antenna Systems. ➤ Machine Learning: Machine Learning And Deep Learning, Soft Computing Techniques. ➤ Computer: Cyber Security, Cloud Computing.
Computer Science and Engineering	<ul style="list-style-type: none"> ➤ Cryptography. ➤ Big Data and Networking. ➤ Natural Language Processing ➤ Machine Learning / Deep Learning ➤ Cryptography ➤ Bioinformatics ➤ Computational Intelligence ➤ Image Processing ➤ Medical Image Processing ➤ Artificial Intelligence ➤ Quantum Computing ➤ Quantum Algorithm ➤ Cloud Computing ➤ Blockchain Technology ➤ e-Governance System ➤ Data Mining ➤ Security ➤ Watermarking ➤ Image Processing

	<ul style="list-style-type: none"> ➤ Graphic Recognition ➤ Combinatorial Image Analysis ➤ Sensor Network System. ➤ Speech Processing ➤ Image Forensic ➤ ChatBot
Electronics and Instrumentation Engineering	<ul style="list-style-type: none"> ➤ Measurements, sensors & process control : Measurements and Instruments, Sensors & Transducers, Biosensors, smart sensors, nanosensors and soft sensors, Industrial instrumentation, Intelligent Instrumentation & Control, Air and water quality monitoring systems based on nanosensors, Agricultural & Environmental instrumentation, Thin film supercapacitors for electrical vehicles. ➤ Control Systems : Linear and Nonlinear Multi-Dimensional Systems, Modeling of Dynamical Systems, Biological Control Systems, Modelling and control of fractional order processes, Modelling and Control of an Autonomous Underwater Vehicle, Machine Learning Applications, Quadcopter based attitude control, Development of Robotic Vehicles, Robust and Adaptive Control, Decentralized control, Sliding Mode Control and its applications, Application of control in Bio-medical field. ➤ Biomedical Fields : Biomedical Instrumentation & Signal Processing, Active transdermal drug delivery system, Modelling of human skin impedance parameters, Objective Pain Measurement, Virtual Reality in Pain Management, Pain Inducer, Human Factors Engineering / Automation, BCI Neuroscience, Smart nanosensors for biomedical instrumentation, IOT based health care monitoring systems, Technology for Societal issues. ➤ Signal processing and electronics, VLSI & Communications : Digital Signal processing and applications, Digital Image processing, D2D communication, UAV and mmWave 5G communication and beyond, Energy Harvesting issues for 5G communication, VLSI design (Analog & Digital), Emerging memories with artificial intelligence (AI) applications, Device Fabrication & Characterization, Advanced applications of non-volatile memories, Nanoelectronics and modern semiconductor devices, Application of machine learning and artificial intelligence. ➤ Energy systems Renewable energy sources and devices: Development of energy storage devices, Energy harvesting systems, Control of Renewable Energy systems, Solar energy and Thin Film solar cells.
Chemistry	<ul style="list-style-type: none"> ➤ Synthesis of Nanocatalysts and their applications in photochemical and Chemical transformation. ➤ Physical Chemistry, Nanoscience and Nanotechnology, Nanocatalysts, Synthesis and characterization of inorganic nanostructured materials (microporous zeolitic and mesoporous materials, clays, layered double hydroxides-LDHs, nanosized metals and metal oxides), as catalysts, sorbents or polymer reinforcing nano-additives. Nanomaterials, Greener methodologies for the production of noble metal and metal oxide nano-materials, nano-composites, Application of nanomaterials in various organic transformations, photodegradation of industrially emerging pollutants and water treatment, waste-derived catalysts for various organic transformations and photodegradation of organic compounds, Adsorption/Interfacial Phenomenon, Development of low-cost and synthetic nano-adsorbents for wastewater treatment, Waste plastics recycling, Co-processing of petroleum vacuum residue with plastics and biomass, Cracking or pyrolysis of biomass Polymer composites and nano-composites, Polymers, Desulfurization, Solid waste Management. ➤ Green Chemistry, Microwave Synthesis, Bivalent Organosulfur compounds and their Applications, Synthesis of Chiral and Achiral Metal Complexes and their Catalytic and Biological Activity. ➤ Synthesis and characterization of fly ash based nano aggregates for various application, Industrial waste management. ➤ Photocatalysis, Dye sensitized solar cells.

	<ul style="list-style-type: none"> ➤ Organic synthesis, Heterogeneous catalysis, Renewable energy. ➤ Studying the photophysical and photochemical processes of organic fluorophores in homogeneous and heterogeneous environments using fluorescence spectroscopy; protein-ligand interaction. ➤ Synthesis, characterization and application of transition metal complexes of nitrogen based heterocyclic ligands; development of chemosensor for anion sensing.
Physics	<ul style="list-style-type: none"> ➤ Resistive memory, devices, Semiconductor nanostructure ➤ Multiferroics ➤ Nanoionic resistive switching devices ➤ Solar energy materials, Solar Photocatalysis, Solar Photovoltaics ➤ Energy storage materials ➤ Nanomaterials ➤ Computational condensed matter physics / material science
Mathematics	<ul style="list-style-type: none"> ➤ Fuzzy set theory and applications, Fuzzy Topology, Fuzzy optimization. ➤ Computational Fluid Dynamics, Micro -nano fluidics Modeling , Numerical Methods to PDE ➤ Linear Algebra: Inverse eigenvalue problem, Functional integral equations and applications.
Humanities and Social Sciences	<ul style="list-style-type: none"> ➤ Development Economics, Industrial trade, Political Economy. ➤ Agricultural Economics, and Rural Development. ➤ Women's Writing in India, Post colonial Literature. ➤ Literary and cultural studies; media studies.
Management Studies	<ul style="list-style-type: none"> ➤ Finance ➤ Marketing ➤ General Management ➤ Human Resource ➤ Accounting ➤ Intellectual Property Rights.

ADMISSION GROUP:

GROUP B: Ph.D. Program—No financial assistance or stipend by NIT Silchar will be provided for this GROUP.

Following students will be considered under this GROUP:

- I) **REGULAR**-The regular students are those who work full-time for their Ph.D. and self-financed.
- II) **SPONSORED**-who are employed in a Central/State Govt. Departments/PSUs/Reputed Educational Institutes/Research organizations/Reputed Industries for doing research in the Institute on a full-time basis. He/She should have at least two years of working experience in the respective field. The candidate must submit the filled-in sponsorship letter (FORM I) from the employer with the application for admission. He / She shall not be entitled to any financial support from the Institute.
- III) **PART-TIME**- This category refers to the candidates who are professionally employed personnel. They have to stay in the Institute/around the Institute at least during the period of course work so that they can attend regular classes as per the Institute academic norm. The applicant must be an employee of a State/Central Govt. Departments/PSUs/ Reputed Educational Institutes/Research organizations/Reputed Industries/Faculty under TEQIP III at the time of admission having at least one year experience in the discipline in which admission is sought. No financial assistance shall be provided by the Institute to such students. A No Objection Certificate from the Head of the Institute/Organization, in which he/she is employed, must be enclosed with application in FORM II-A.
- IV) **INSTITUTE EMPLOYEES**- Employees of NIT Silchar. A No Objection Certificate from the concerned Head of the Department and the Director must be enclosed with application form (FORM II-B).
- V) **PROJECT STAFF** -This category refers to the candidates who work on sponsored projects in the Institute. A No Objection Certificate from the Principal Investigator of the concerned project and Dean (R & C) must be enclosed with application form (FORM III).

- VI) SPONSORED (EXTERNAL REGISTRATION) - Candidates employed in R&D organizations / educational Institutes having adequate research facilities. Sponsorship certificate (FORM IV) from the Head of the organization where the candidate is employed must be enclosed at the time of application.

Eligibility for application in GROUP B:

1. Students for admission into Ph.D. Programs in Engineering Departments must satisfy one of the following criteria:
 - i) M.E./M.Tech. or equivalent in an appropriate area with a minimum CPI of 6.5 (on a 10 point scale) or equivalent (60% of marks). For SC/ST/PwD candidates, a minimum CPI of 6.0 (on a 10 point scale) or equivalent (55% of marks).
 - ii) B.E./B.Tech. with an excellent academic record with valid GATE score and with a CPI of at least 8.0 (on 10 point scale) or equivalent (75% of marks). For graduates from IITs/NITs, the minimum CPI requirement is 7.0 (on 10 point scale). For SC/ST/PwD candidates, there is a relaxation of 0.5 CPI or 5% of marks.
2. Students for admission into the Ph.D. Programs in Science departments must have a Master degree in the relevant discipline with a minimum CPI of 6.5 (on a 10 point scale) or equivalent (60% of marks). For SC/ST/PwD candidates, a minimum CPI of 6.0 (on a 10 point scale) or equivalent (55% of marks) is required.
3. Students for admission into the Ph.D. Programs in Management Studies departments must have a Master's degree in Business Administration or Master's degree in relevant disciplines with a minimum CPI of 6.5 (on a 10 point scale) or equivalent (60% of marks). For SC/ST/PwD candidates, a minimum CPI of 6.0 (on a 10 point scale) or equivalent (55% of marks) is required.
4. Students for admission into the Ph.D. Programs in Humanities and Social Sciences (HSS) Department must have a Masters degree in any field with a minimum CPI of 6.5 (on a 10 point scale) or equivalent (60 % of marks). For SC / ST/ PwD candidates, a minimum CPI of 6.0 (on a 10 point scale) or equivalent (55 % of marks) is required.

Downloadable application form with other relevant papers is available in the Institute's website: **www.nits.ac.in**.

Candidates applying for multiple departments has to submit separate application form with separate application fee as follows:

An Application Fee of **Rs.500/-** (for Open / OBC) **OR Rs.250/-** (for SC/ST/PwD) must be paid via online payment and steps for online payment is as follows:

1. www.onlinesbi.com
2. State Bank Collect (SB Collect).
3. Accept and proceed.
4. State of Institute> Assam.
5. Type of Institute> Educational institute> Go.
6. Educational Institutions Name> Select online fee collection account NIT Silchar> Submit.
7. Select payment category as "Application fee for PhD Admission 2021".
8. Fill the required information and submit.

The payment reference number and date of the payment to be mentioned in the application form, otherwise the application form will be treated as cancelled.

Scanned copy of the Application form complete in all respects and the receipt/payments details must be emailed to phd_admission@nits.ac.in with a copy to admit_phd@nits.ac.in **on or before 28th December 2020**. **Subject line should be "Application for Ph.D. program- *Name of the department (applying for)*- Group B"**.

The hard copy of the filled in and signed Application form complete in all respects along with the payment details should be submitted to the Dean (R&C), NIT Silchar on or before 28th December 2020. **The subject line of the envelope should be "Application for Ph.D. program- *Name of the department (applying for)* - Group B"**.

The candidates are advised to give their latest contact numbers /e-mail ids in the application form.

The Institute reserves the right to reject any or all applications or it may amend any of the clauses above as per orders of the competent authority/ Government of India.

The result will be available in the website.

Important Dates:

- | | | |
|------|--|--|
| (i) | Last date of submission of form to the Institute . | : 28th December 2020 |
| (ii) | List of short-listed candidates to be uploaded in the institute website | : 08th January 2021 |

- **The date of online counseling and online document verification, upload of the list of provisionally selected candidates in the Institute website (including waitlisted candidates) and the period of Admission and Registration will be published at appropriate time in the institute website.**
- **Candidates are requested to check the institute website regularly for updates.**
- **Hostel accommodation is subject to availability.**

The details of specialisations, regulations, and applications form (downloadable) is available in the Institute website **www.nits.ac.in**.

GENERAL TERMS AND CONDITIONS

- 1. The Institute reserves the right to cancel the candidature without assigning any reason thereof.**
- 2. The prescribed qualification are minimum and mere possession of the same does not entitle candidates to be called for written test and counselling.**
- 3. No correspondence will be entertained with the candidates, who are not called for counseling/selected for appointment.**
- 4. Canvassing in any form will result in disqualification of candidature.**
- 5. Legal disputes, if any, will be restricted within the jurisdiction of Silchar Court only.**
- 6. Candidates should send their application form along with all supporting documents duly self attested.**
- 7. All reserved category candidates shall be required to submit self-attested copies of the latest Caste certificate issued by competent authority.**
- 8. Candidates must produce original marksheets and certificates during verification and counselling at the time of counselling, if called for.**

OTHER IMPORTANT INFORMATION

- 1. Candidates are requested to provide their active email Id/mobile phone numbers/landline phone numbers in the application form for easy contact.**
- 2. List of short listed candidates will be displayed on the Website of the Institute. No personal intimation will be made to the candidates. Candidates are advised to visit the Institute website regularly.**

**Sd/-
Dean (R & C)**