NATIONAL INSTITUTE OF TECHNOLOGY SILCHAR

SILCHAR– 788010, ASSAM, INDIA

Admission into Ph.D. Programme for the session July to December, 2022

No. Dean (RC)/105/2022/1 **Date: 06-05-2022**

Applications are invited for admission into **Ph.D. programme** in the following departments with the area/ specializations and admission group as mentioned in the table for the session July to Dec 2022.

DEPARTMENT	SPECIALISATION	GROUP
Civil Engineering	➢ Earthquake Engineering, Structural Engineering ➢ River flow modeling ➢ Hydrology, Water Resources Engineering , Optimization methods ➢ Concrete Technology & Structural Engineering ➢ Transportation planning ➢ Sediment transport ➢ Environmental Engineering, Water and wastewater treatment , Adsorption of pollutants ➢ Structural Engineering/Earthquake Engineering ➢ River flow modeling ➢ Structural Engineering/Earthquake Engineering ➢ Application of probability and reliability theory in geotechnical engineering ➢ Structural Engineering, Geotechnical Engineering, Earthquake Engineering ➢ Soft computing techniques and applications to hydrology & hydraulics Climate Change impact on water resources. ➢ Concrete Technology ➢ Climate change, Flood modeling ➢ Passive vibration control of structures, reliability analysis of structures, robust design optimization of structures under uncertainty ➢ Coastal Engineering and Remote Sensing and GIS applications ➢ Real time hybrid simulation for seismic analysis and design of structural systems (Structural Dynamics), Structural topology optimization under uncertainty, Climate-resilient structure and infrastructure design ➢ Geotechnical Engineering (Constructive modeling) ➢ Pavement Engineering ➢ Seismic hazard analysis, liquefaction, ground response analysis, slope stability. ➢ Structural Dynamics & Control, Functionally graded materials Vibro-acoustics, Soil-structure interaction ➢ Industrial Waste Management, Solid Waste Management, Water and Wastewater treatment, Adsorption Technology, Acid Mine Drainage, Sludge Management and Utilization,	Group A and Group B

DEPARTMENT	SPECIALISATION	GROUP
	Composting ➢ **Interdisciplinary Specialisation**s: Image Processing, Nano & Composite materials, Application of Optimization Techniques (Conventional & non-conventional) in any area, Application of Artificial Intelligence for soil characterization and application of image processing soil classification, Material, Chemical Engineering, Green Chemistry, Intelligent transportation system, Application of Image Processing in Geotechnical Engineering, Watershed management, River basin management, Groundwater management and application of soft computing embedded with MCDM, Composite Structures, Vibration control of structural systems	
Computer Science and Engineering	➢ Artificial intelligence, Robotics, Machine Learning ,Data Science, Natural Language Processing, Deep Learning Cyber Security, Healthcare informatics, Speech processing, Image/Video processing, Information Retrieval, Gender Bias, Quantum Computing, Machine Learning, Healthcare Computing, Big Data ➢ **Interdisciplinary Specialisations:** Sensors and Antenna	Group A and Group B
Electrical Engineering	➢ Power and Energy Systems ➢ Control, Instrumentation, and Automation ➢ Signal, Image Processing and VLSI ➢ Power Electronics and Electric Drives ➢ High Voltage Engineering and Energy Materials ➢ **Interdisciplinary Specialisations:** Electric Vehicles, Engineering Optimization, Design of Lithium-ion Batteries, Insulation Design and Diagnosis of Electric Vehicles, Nanotechnology, Nanoelctronics, Image Processing, Optimization of energy system resources, Renewable Energy, Robots, their control and applications including drones, underwater vehicles, flexible manipulator, etc., Soft computing Application, Advanced Biomass Cookstoves, Application of Control in power electronics and renewable energy, Fractional order circuits and systems, Application of Soft computing techniques and deep learning in Brainwaves Analysis, Renewable Energy / Control System	Group A and Group B
Electronics and Communication Engineering	➢ Semiconductor Devices, Electronic Circuits, and MEMS, Nanoelectronics, Solar Photovoltaics, Energy Harvesting, Micro/nano electronic Devices, VLSI Interconnects, CMOS-MEMS, Digital VLSI circuits, VLSI Architectures, Embedded systems, Micro/Nanofabrication, Semiconductor Materials and Devices, CMOS Logic & Non-Volatile Memory devices, Sensors & Actuators and MEMS, Bio sensor ➢ Speech Processing, Image and Video Processing, Bio-medical Signal and Image Processing, Machine Learning, Soft	Group A and Group B

DEPARTMENT	SPECIALISATION	GROUP
	Computing Techniques, Communication Engineering and the other areas related to Signal Processing, Machine Learning / Deep Learning applications in image processing and computer vision. ➢ Wireless Communications, Satellite Communications, Wireless communications for 5G and 6G, Millimetre wave communications, Wireless Communications, Massive MIMO, MIMO, MIMO-OFDM, Smart Grid Communications, Green Communications, Quantum Communications, Machine Learning for Communications, Applications of Soft Computing Techniques, Antenna Design for wireless communications, Cooperative Relay Networks, Device-to-Device Communications, RF Energy Harvesting, Wireless Sensor Networks, IoT, Physical Layer Security ➢ Implantable antenna sensor for biomedical applications. Antenna for 5G communications. MIMO antenna, High-frequency solid state devices; RFICs, Antennas, Metamaterial based devices, Millimeter-wave Devices, Gyrotron Oscillators, Gyro-Traveling Wave Tubes, Remote detection of radioactive materials using millimetre wave signal, Machine Learning, Antenna Design, Metamaterial, WBAN, Flexible Antennas, Antenna Array Optimization, RF Energy Harvesting Systems, Dielectric Resonators and Applications, EBG and FSS Structures, Antennas for 5G Wireless Communications, Computational Intelligence Applications in Microwave and Millimeter Wave Engineering ➢ **Interdisciplinary Specialisations:** Novel Concepts on Solar Photovoltaics: Materials to Devices, Smart Transportation Systems, RF Energy Harvesting, Biomedical Sensor, Nanotechnology, Renewable Energy, Machine Learning, Soft Computing, Machine Learning, Sensing application, Biomedical Image Processing, Deep Learning, Machine Learning (ML) & Deep Learning, Inverse Problems (specifically deconvolution), Speech and Audio Processing, Image and Video Processing, Computer Vision, Machine Learning, Pattern Recognition, Biomedical Signal Processing, Medical Image Processing, Natural Language processing, Communication systems, Soft Computing Techniques, Deep Learning, Machine Learning, Remote Sensing, Advanced Materials for MEMS applications, Applied Physics, Electrical, Instrumentation	
Electronics and Instrumentation Engineering	➢ Sensing Technology, Instrumentation, Biomedical Instrumentation & signal processing, Smart sensor,	Group A and Group B

DEPARTMENT	SPECIALISATION	GROUP
	Industrial Instrumentation, Machine Learning, Application of IoT. ➢ Transdermal Drug delivery, Medical Electronic devices, Energy storage devices. ➢ Biomedical signal processing, machine learning algorithms, artificial intelligence, intelligent instrumentation for health monitoring ➢ New Generation Solar Cell; Analytics, Control and Optimisation of Process ➢ Control systems; Renewable Energy system; Energy storage (battery, supercapacitor, fuel cell); Battery management system; Electric vehicle; second life of battery, Fractional order systems ➢ Digital TICs, modern semiconductor devices, solar cells, Image processing ➢ Control of Cyber Physical Systems, Network Control Systems, Event-triggered Control, Sliding Mode Control, Learning Based Control, Control of Multiagent system, Application areas: Biological systems, Robotics, etc., Modelling of Epidemics ➢ 1. Communication: IRS for 6G Communication, Blockchain for 6G, UAV for 5G and beyond, IoT & IIoT Communication, Vehicular: V2X communication, D2D, mmWave 5G, Cognitive Radio, MIMO, etc. 2. Image and Signal Processing: Image Segmentation models for real-time and medical applications, Medical Imaging, 3. Biomedical Signal Processing and its applications, 4. AI: Machine Learning, Deep Learning and its applications in Healthcare, Communication and Signal Processing. ➢ Robust Control, Modelling of dynamic systems, Robotics, Control of cyber physical systems, Motion planning of single and multi agent systems, Autonomous Aerial and Underwater Vehicles, Formation control of multiple robotic systems/ ➢ Biomedical Instrumentation, Pain Measurement and analysis, VR/AR in Biomedical applications, Wearable devices, Traditional and Indigenous healing methods, Automation for societal needs, Biomedical waste disposer - sanitary napkin and condom, Design and development of products ➢ Time Delay Systems, Robust & Adaptive Control, Lyapunov Stability, Fractional Order Systems, Modeling of Dynamical Systems, Linear and Nonlinear Multi-Dimensional Systems, Biological Control System, Control of Renewable energy ➢ 1. Design and Development of Energy Harvesting Devices,	

DEPARTMENT	SPECIALISATION	GROUP
	2. Development of Sensors for biomedical applications such as continuous monitoring of Glucose, pH, Temperature, Pulse Rate etc, 3. Design and Development of Sensing Devices for water quality and air quality monitoring, 4. Design, development and optimization of supercapacitors, 5. Gas-sensors 6. NEMS & MEMS Devices ➢ Time Delay Systems, Robust & Adaptive Control, Lyapunov Stability, Fractional Order Systems, Modeling of Dynamical Systems, Control of Renewable energy ➢ **Interdisciplinary Specialisations**: Condition monitoring and fault diagnosis, renewable energy, Medical Imaging, Sensors, Robotics involving Mechanical engineering and electrical engineering Supercapacitor & Electrochemical energy storage, Biomedical Instrumentation, Development of Medical Instruments, Transportation, renewable energy, Robotics	
Mechanical Engineering	➢ Advanced manufacturing processes; Microfluidics; Composite materials; Renewable Engg; Molecular Dynamics; Micromixing, Heat Transfer; Non-Newtonian Fluid Mechanics; Nano fuel; Biodiesel; Hydrogen; IC engine; Combustion, and pollution control; Uncertainty Quantification; Molecular Dynamics; Tribology of Bearing; Multi-functional Composites; Smart and Graded Structures; Additive and Micro-nano-Manufacturing; Parallel Manipulator; Robotics and Control; Compliant Mechanism; Additive manufacturing; Dynamics of the robotic system; EDM, Mechanism; Surgical Robot; Smart materials; Mechatronics; 3D-Printing; Shape Memory Alloy; Tribology; Surface Engineering; Composite materials; Coatings; Nanolubrication; Material Characterization, Machining and Surface finishing; Structural Health Monitoring ➢ **Interdisciplinary Specialisations:** Microfluidics, Thin film, material characterization, additive manufacturing, Robotics and Control, Battery and fuel cell technology, Machine Learning, Molecular Dynamics, Uncertainty Quantification, Mechatronics Devices, Machines coupling Effects on Drive Dynamics, Biomechanics, Soft Computing, Thin film deposition, Hybrid Renewable Energy Systems, Mechanical and Fracture characterization, Phase-change materials, Mathematics	Group A and Group B
Chemistry	➢ Development of nanomaterials and/or mesoporous materials based on modification of graphitic carbon nitride (g-C3N4), hydroxyapatite (HAP) and metalorganic framework (MOF) and investigation of their potential applications as catalysts in chemical transformation and environmental remediation. ➢ Physical Chemistry, Nanoscience and Nanotechnology,	Group A and Group B

DEPARTMENT	SPECIALISATION	GROUP
	Nanocatalysts, Synthesis and characterization of inorganic nanostructured materials (microporouszeolitic and mesoporous materials, clays, layered doubled hydroxides-LDHs, nanosized metals and metal oxides), as catalysts, sorbents or polymer reinforcing nano-additives. ➢ Organic synthesis, Synthesis of Schiff bases and Metal complexes, DFT and Biological studies. ➢ Organic Chemistry and Renewable Energy. ➢ Synthesis and Characterization of Nanomaterials for various applications (such as, Photo-catalysis, Nanoelectronics, Sensors etc.). Recycling and Potential Utilization of Hazardous Industrial Waste Materials. ➢ Studying the photophysical and photochemical processes of organic fluorophores in homogeneous and heterogeneous environments using fluorescence spectroscopy; protein-ligand interaction ➢ **Interdisciplinary Specialisations**: Application of nanomaterials for electrochemical applications (with E & I Department), Renewable energy, Nano-technology, Nano-electronics, Bio-fuel and Energy from Bio-waste Energy and Environment.	
Physics	➢ Experimental Condensed Matter Physics ➢ Theoretical/Computational Condensed Matter Physics ➢ **Interdisciplinary Specialisations**: Solar Cells & Green Hydrogen Production, Image Processing	Group A and Group B
Mathematics	➢ Fuzzy Set Theory and its Applications, Fixed point theory ➢ Integral equation, Integro-differential equation, Inverse eigenvalue problem, Fuzzy set theory and optimization, Sequence spaces and summability. ➢ Complex Analysis, Entire Functions. ➢ Mathematical Modelling of Infectious Disease. ➢ Computational Fluid Dynamics (CFD), Micro and nano fluidics modeling. ➢ Elastodynamics. ➢ Operations Research, Mathematical Modelling, Optimization Techniques, Elasto-dynamics, Fuzzy Optimization, Fuzzy Statistics. ➢ **Interdisciplinary Specialisations:** Application of Integro-differential equation in Image processing	Group A and Group B
Humanities and Social Sciences	➢ Development Economics, Agricultural Economics and Rural Development ➢ Women's Writing, Postcolonial Literature, Cultural Studies and Feminist Literature ➢ **Interdisciplinary Specialisations:** Media Studies	Group A and Group B

DEPARTMENT	SPECIALISATION	GROUP
Management Studies	➢ Human Resource and Organization Behavior ➢ Finance ➢ Marketing and Intellectual Property Rights ➢ Intellectual Property Rights. ➢ **Interdisciplinary Specialisations:** Patents, Industrial Designs	Group A and Group B

ADMISSIONGROUP:

1. There are two Groups(A and B) of admission under Ph.D. Program

GROUP A: Ph.D. Program - Regular Category who may receive fellowship from the MoE / CSIR/UGC or any other recognized funding agency.

Fellowship: As per MoE/CSIR/UGC guide lines.

Research Fellowship is available to the scholars who are admitted to Ph.D. programmes in different departments subject to the availability as stipulated by Ministry of Education. The award and renewal of the fellowship is as per the guide lines issued by MoE, from time to time.

In case of students, who secure a new job or otherwise wish to move outside the institute and end their doctoral program prematurely, need to refund any scholarship received.

Eligibility for application in GROUPA:

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 with GATE / NET qualification 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 (ona10 points scale) or equivalent (55%of marks).
   ii)B.E./B. Tech. with an excellent academic recode 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 GATE / UGC / CSIR / NBHM / NET score for admission with a minimum CPI of 6.5 (ona10 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) with a GATE / UGC / CSIR / NBHM / NET score is required for admission.
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 Engineering/Technology with a minimum CPI of 6.5 (on a 10 point scale) or equivalent (60% of marks) or Master degree in other disciplines with a minimum CPI of 6.5(on a10 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. A score in NET /GATE/UGC is required for all.
4. Students for admission in to the Ph.D. Programs in Humanities and Social Sciences (HSS) Department must have a Master's degree in any field with a minimum CPI of 6.5 (on a 10 point scale) or equivalent (60 %of marks) or Master degree in other 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. A score in NET/GATE /UGC is required for all.
5. Candidates appearing for final year BE/B.Tech./ME / M.Tech/ MSc/ MA/ MBA with valid GATE score are also eligible to apply. However, their final result must be published on or before the publication of the provisional selection list.

GROUPB: 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 attend regular offline classes during coursework 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(FORMII-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(FORMII-C).

VI) SPONSORED (EXTERNAL REGISTRATION) –Candidates employed in R&D organizations/educational Institutes having adequate research facilities. Sponsorship certificate (FORMIII) 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: 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%ofmarks). For SC/ST/PwD candidates, a minimum CPI of 6.0(ona10 point scale) or equivalent (55%ofmarks).
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 10point 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 Master's 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.

APPLICATION

The applicants can apply for the PhD program through the online application portal available at http://admission.nits.ac.in/phdadmission2022

An Application Fee of **Rs.500**/-(for Open/OBC/EWS) **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> Online fee collection account NIT Silchar>Submit.
7. Select payment category as "Application fee for PhD Admission 2022".
8. Fill the required information and submit.

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

The applicant must upload all relevant documents, self-attested, in connection with the credentials claimed by the applicant in pdf format along with the scanned signed copy of the Declaration form at the time of filling up of application form.

The final pdf copy of the Application form must be emailed to *phd_admission_22@nits.ac.in* with a copy to *admit_phd_22@nits.ac.in* **on or before 2nd June, 2022 by 5.00p.m. Subject line should be "Application for Ph.D. program-** ***Name of the department (applying for)-Group A/Group B Category*****". No need to send the hard copy of the Application form.**

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.**	**: 2nd June,2022, 5 PM**
(ii)	**List of short-listed candidates to be uploaded in the institute website (To be communicated by the department concerned to the students through Institute's Website)**	**: 7th June,2022**
(iii)	**Date of offline Counselling and document verification**	**: 20.6.2022-21.6.2022**
(iv)	**Date of sending recommendation list by the Department to Dean (R & C)**	**: 21.6.2022**
(v)	**List of provisionally selected candidates to be uploaded in the Institute website (including waitlisted candidates)**	**: 23.6.2022**
(vi)	**Period of Admission and Registration**	**:24.6.2022**
(vii)	**Declaration of Vacancy status**	**:27.6.2022**
(viii)	**Spot counselling from waitlisted candidates,**	

verification and admission (depending on vacancy) :28.6.2022

- **Candidates are requested to check the institute website regularly for updates.**
- **Hostel accommodation is subject to availability.**

GENERAL TERMS AND CONDITIONS

1. **The Institute reserves the right to cancel the candidature without assigning any reason thereof.**
2. **The prescribed qualifications 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 upload 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 mark sheets 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 shortlisted 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)