राष्ट्रीय प्रौद्योगिकी संस्थान नागालैंड
NATIONAL INSTITUTE OF TECHNOLOGY NAGALAND
Chumukedima - 797103
Nagaland

Ref.No. NIT-N/ADVT/Research/0002/2025 dated 10/04/2025

A. Ph.D. PROGRAMME

Applications are invited from qualified candidates for admission to the Ph.D. program (Full-Time) in the disciplines of CE, EEE, ECE, CSE, EIE, ME, and S&H (Mathematics, Physics, Chemistry), Integrated Ph.D. program, and Interdisciplinary Research (IR). The Departments and Research Areas in which the following Programs will be offered are listed below:

Sl. No.	Department	Specialization/ Area of Research/ IR domain	Eligible Disciplines
1.	Civil Engineering	Structural Engineering, Environmental Engineering, Concrete Technology, functionally graded concrete, concrete microstructure and durability, Steel–Concrete composite Structures, Finite Element Modelling, Waste Utilization in Concrete and Bricks Manufacturing, Solid Waste Management, Soil Stabilized Roads, and Full Depth Reclamation (FDR) of Roads.	B. Tech. in Civil Engineering, M. Tech. in relevant discipline
2.	Computer Science and Engineering	Data Analytics, Artificial Intelligence, Machine Learning, Deep Learning, Bioinformatics, Computer Networks, Wireless Communication and Networks, IoT, Mobile Communications, Device to Device Communication, Vehicular Ad-Hoc Network, Public Safety Network, Semantic Communication, Image Processing, Information and Cyber Security, Block chain, Biomedical Image Processing, Data Mining, Stock Market Prediction using Machine Learning and Deep Learning, Multimedia Hashing, Sentiment Analysis, Recommender Systems, Intelligent Networks for Smart Cities, Intelligent Transportation system.	B. Tech./B.E., M. Tech./ M.E in Engineering/ Technology or Equivalent in Computer Science / Information Technology and Allied Branches.
3.	Electrical and Electronics Engineering	Micro Electro Mechanical Systems (MEMS), MEMS / NEMS Energy Harvesters, Bio-Medical Applications, Solar Cell, Thin Films, Self-Cleaning Technology for Solar Panels, Nano Structures, High Power Devices, Solar Photo-voltaic systems, Wind Energy, Biogas, Renewable Energy Systems - Forecasting / Predictive analytics, Machine Fault Diagnostics, Power Quality, Power Electronics, Optimization, Micro Grid, Smart Grids, Demand side Management, Machine Learning	B.E./B. Tech., M.E./M.Tech. in Electrical and Electronics, Electronics and Communication, Electronics and Instrumentation Engineering equivalent/relevant

		and Deep Learning, Internet of Things, Smart Transportation Systems, Artificial Intelligence for Health Care Systems, AI for Educational Systems, AI for Industrial Internet of Things, Robotics for Agriculture. Machine Learning for Machinery Maintenance, Machinery Fault Diagnostics, Industrial Internet of Things, IoT / Fog Computing for Industrial Applications, Smart Transportation Systems, Vehicular Networks, Wireless Adhoc and Sensor Networks, Intelligent Automotive Applications, Signal Processing, Advanced Communication, AI for Bio-Medical Systems, AI for Educational Systems, Power System Fault Analysis, Wind Farms, IoT in Smart Grids, Demand Side Management, Machine Learning in Smart Grids Control System, Optimization, Estimation, Control design for power system, Control design for Microgrid, PV system and Wind energy system, Control design for Power Converters and Filters, Converter Design, Solar Cell Device, Biomedical instrumentation and Control, Machine Learning and Deep Learning, Control development for robotic vehicles. Wireless Sensor Networks, Smart Grids, Demand Side Management, Power Systems, Internet of Things, Electric Vehicles: PEV/PHEV in Smart Distribution grid, Artificial Intelligence, Machine Learning and Deep Learning, Industrial Automation, Drone Technology. Power Systems Distribution Automation, Power Systems Protection, Wide Area Measurement Systems, Power System Analysis, Dynamics and Control, FACTS, Grid Integrated Renewable Energy Systems, Electricity Market, Congestion Management, Power System Cyber Security Power Electronics, Restructured Power Systems, Smart Grid, Power System Economics, Embedded Systems, Power System Operation & Control, Electric Drives	discipline.
4.	Electronics and Communication Engineering	Semiconductor device modelling, Photovoltaic devices, Nanoelectronics, Gas sensors, Memory devices for neuromorphic applications, Optoelectronic Devices and Displays, Photodetectors, Bio Sensors, Power Devices, Quantum devices, Compound Semiconductors, Nitride semiconductors and High-Speed Devices, Flexible electronic devices,	B.E/B.Tech., M.E/M.Tech in Electronics and Communication Engineering, Electrical Engineering, Instrumentation Engineering,

		Nanotechnology, Low power devices and circuits, Organic electronics, Speech Processing, Antenna Design, Microstrip Antenna Design, Digital Image Processing, Medical Electronics, VLSI, Circuits and Systems, MEMs, Internet of Things (IoT), Artificial Intelligence and Machine learning, Wireless Communication, 5G/6G Communication, Cryptography, Image classification, computer vision, Bio medical signal processing.	Nanotechnology and Allied Branches.
5.	Electronics and Instrumentation Engineering	Wireless Communication, Control of Smart Structures, WSN, Embedded Systems, MEMS, IoT, Internet of Vehicles (IoV), Mobile Ad Hoc Network, Thin Film Flexible Bio-Transducer/Sensor, photo sensors, gas sensors, solar cells, Thin Film Solar Cells, Piezoelectric Sensors, Thin Film Flexible Devices, Solid State Batteries. Artificial intelligence, Machine learning, Deep learning, Network anomalies detection using AI algorithms, Resource management using Fog/IoT systems. Behavioural OTFT micro/nano device for Biosensing of SARS-CoV-2/ DNA, Multianalyte assays suitable for body or health monitoring, Enhanced separation and sensing based biosensor utilizing Organic Thin Film Transistors (OTFT's) for capturing of Microorganisms, IoT Enable Smart Mental Healthcare Monitoring and Rehabilitation System. Optoelectronic Instrumentation, Fiber optic communication, Optical sensors and system design, Labview based Virtual Instrumentation design. Fault diagnosis for Machines, Autonomous vehicles, Electric vehicle, DC Microgrids, Embedded Systems, Intelligent systems, Renewable Energy, Bio Signal Processing Applications.	B.E./B. Tech., M.E./M.Tech. in Electronics and Instrumentation Engg., Electronics and Communication Engg., Electrical and Electronics Engg., or relevant/ equivalent discipline. Material Science and Engineering, Industrial Instrumentation, Process Control, Fiber Optics and Laser Instrumentation, Control systems, Power Electronics, Electrical Engg., Electronics Engg., Electrical drives, Embedded Systems, Applied Electronics, Comm. Systems, Comm. Engg., Communication Networks, VLSI, Signal Processing, MEMS, Microfluidics, or relevant/ equivalent discipline.
6.	Mechanical Engineering	Advanced Manufacturing, CAD/CAM/CIM, Mechatronics and Automation, Material Science and Engineering: Composites and Alloys, Soft Computing and Optimization, Power Plant Engineering, Biomass, Tribology, Biodiesel. Thermal Science, CFD, Micro Machining, Smart Manufacturing, Robotics, AI/ML/DS/IoT Application in Mechanical	B.E./B. Tech., M.E./M.Tech. in Mechanical Engineering, Metallurgical Engineering, Material Science, Production Engineering,

		Engineering, FEM, Solid Mechanics, Vibration, Fracture and Fatigue.	Mechanical Design, Biomedical and Engineering Fluid Mechanics and equivalent / relevant /Allied discipline.
7.	Science & Humanities (Mathematics, Physics, Chemistry)	**MATHEMATICS:** Optimization Theory, Cooperative Game Theory, Stochastic and Differential Game, Supply chain Network. Algebra, Theory of Rings and Modules, Algebraic Coding Theory and Cryptography. **PHYSICS:** Nanomaterials, Nanomagnetism, Thin Film Technology, Material science, Membrane Science & Technology. **CHEMISTRY**: Chemical Dynamics, Bioinorganic and Biophysical Chemistry, Natural product chemistry, Drug development, Development of low cost adsorbent materials and applications, Environmental Chemistry. Applied Organic Catalysis, Enantioselective synthesis, Self-Assembly and Supramolecular chemistry, Green organic synthesis, Functional materials & Hybrid composite materials	MSc in Mathematics/ MSc in Statistics/Operations Research. MSc Physics/Master's in Physical Sciences/Engineering or allied field. MSc in Chemistry. MSc/Masters in Chemical/Biological Sciences/Engineering or allied field.

INTERDISCIPLINARY RESEARCH TOPICS

Green Nanomaterials for Agriculture & Fisheries, Biosensors, Generative AI Modelling for Multi Data Analysis, Artificial intelligence in Game Theory Applications, Multimodal Goal oriented Semantic communication (SemCom) for 6G network, Image processing for Medical and Agricultural Applications, Optimization in Supply Chain Management, Kinematics and Dynamics Study of Different Robots, biodiesel and biomass properties and performance analysis using machine learning methods, Optimization in mechanical design, Optimization and Modelling of Nano-Devices, Delay Differential Equation, AI for Bio-Medical Systems, Machine Learning and Deep Learning for Predictive Analytics in Renewable Energy, Block Chain Technology for Smart Grids, wireless sensor network applications in smart grid, Micro Electro Mechanical Systems (MEMS), MEMS / NEMS Energy Harvesters, Bio-Medical Applications, Thin Films, Self-Cleaning Technology for Solar Panels, Nano Structures, High Power Devices, Drone Technology for Agriculture Applications, IoT for Medical and Agricultural Applications, Application of Artificial Intelligence in Robotics, Production of biodiesel and biomass and their performance analysis, Production of new exotic materials and their analysis, System design using unconventional optimization technique, Design and analysis of robotic using ANSYS, Power System Cyber Security, Application of IoT in Power System, Application of Graph Theory and Block chain in Power system, Disaster recovery communication Network with Cellular/ D2D/V2V/ V2I/ UAV technologies, Designing IoT/ WSN based communication system for Smart agriculture, Application of Machine learning and AI in Next Generation Wireless communication, Precision Agriculture Using IoT.

***Research topics are not restricted to the above list**

ELIGIBILITY CRITERIA FOR PHD PROGRAMME IN ENGINEERING

1. Master's degree in Engineering / Technology with Bachelor's degree in Engineering / Technology with a minimum First class and CGPA/CPI of 6.5 or above (on scale of 10) or 60 % marks (55% marks for SC/ST candidates).
2. MS by Research in Engineering / 5-year integrated Masters/ Dual Degree in Engineering or BS+MS (5-year integrated course) from CFTI in a relevant area specified above with a minimum First class and CGPA/CPI of 6.5 or above (on scale of 10) or 60 % marks (55% marks for SC/ST candidates).
3. Master's degree in Engineering / Technology with Master degree in Computer Application with a minimum First class and CGPA/CPI of 6.5 or above (on scale of 10) or 60 % marks (55% marks for SC/ST candidates).
4. MBBS with a Master degree with a minimum First class and CGPA/CPI of 6.5 or above (on scale of 10) or 60 % marks (55% marks for SC/ST candidates).

ELIGIBILITY CRITERIA FOR PHD PROGRAMME IN SCIENCE & HUMANITIES

Master's degree in Science/Humanities/M.E./M.Tech or MS by Research in Engineering/ BS+MS (5-year integrated course) from CFTI or equivalent degree, with minimum First class and CGPA/CPI of 6.5 or above (on scale of 10) or 60 % marks (55% marks for SC/ST candidates)

ELIGIBILITY CRITERIA FOR INTEGRATED PH.D. PROGRAMME

Bachelor's degree in Engineering / Technology or equivalent in the disciplines of Civil Engineering, Electrical and Electronics Engineering, Electronics and Instrumentation Engineering, Electronics and Communication Engineering, Mechanical Engineering and Computer Science and Engineering with a minimum CGPA of 8.5 or above (on scale of 10) or 80 percent of marks and a valid GATE score. If the qualifying B.E. / B.Tech. degree is from an IIT / NIT or any Centrally Funded Technical Institute (CFTI) with CGPA 8.5 or 80 percent of marks, then the valid GATE score requirement shall be exempted.

GUIDELINES FOR ADMISSION TO INTERDISCIPLINARY RESEARCH

1. The candidate shall submit his/her research plan in about 250 to 300 words along with his/her application.

2. Irrespective of application for IR or in one field, the candidate shall be examined in his/her discipline only to assess his / her suitability.
    a. If Bachelor and Master degree are from the same discipline, the candidate must take the selection exam in the same department only. After qualifying in the exam in his/her own discipline through the institute written Test /GATE, he/she will be considered for IR, if the candidate wishes to pursue in IR. The committee (IR) will consider only the Co-guide for the candidate.
    b. If the candidate has Bachelor and Master degree from different disciplines, then the institute Committee (IR) will examine the research proposal / plan of the candidate including his/ her written test/interview performance. This committee may recommend probable Supervisors and Co-Supervisor to guide the scholar.
3. The Scholar can interact with the probable guides recommended by the Committee and select his/her Guides for his/her work with the approval of Associate Dean/ Dean (R&C).

OTHER GUIDELINES

- Candidates applying for Ph.D. Program/ Integrated Ph.D. Program can apply through the downloaded application form only.
- Integrated Ph.D. Program is only applicable for all the engineering departments only in full-time mode.
- For Interdisciplinary Research (IR) applications, the candidate can choose the research proposal/ plan from the list of department specializations/ areas of research, but shall not be restricted to only those areas.
- If anyone requires to **apply for more than one specialization**, he/she should apply separately for each specialization with a **separate application fee**.
- Candidates can attach their academic profile, if required. The academic profile includes the following information:
    1. Details of publications/conference papers
    2. Awards, patents, prizes etc.,
    3. Other activities
- If the candidate is applying for full-time Ph.D. and he/she is employed, relieving certificate from the employer should be produced at the time of admission.
- The Institute will not be responsible for any error in application process.
- **The date and time of written test/interview for the shortlisted candidates will be uploaded in the institute website. So, the candidates are requested to check the**

website regularly for any updates.

- **No separate intimation will be given to the individual applicant.**

The duly filled in application form along with enclosures and a non-refundable application fee of Rs. 500/- (SC / ST / PH candidates are exempted from application fee) by means of online transaction (**Account Name: IRG NIT Nagaland, Account Number: 35747839287, IFSC Code: SBIN0007543, Branch: SBI, Chumukedima**) should be sent to the office of the **Associate Dean (R&C), National Institute of Technology Nagaland, Chumukedima – 797 103, Nagaland, by Registered Post only on or before 25-05-2025.**

The Rules and Regulations of the Ph.D. program and Integrated Ph.D. program may be downloaded from the given link below:
http://nitnagaland.ac.in/index.php/academics/rules-and-regulations

NOTE:

1. **Full-Time candidates (With GATE/NET)** in order of merit will be considered for the institute scholarship, subject to the availability of funds from MoE.
2. **Candidates awaiting their final year results** are also eligible to apply for all the programs, subject to the submission of passing certificates, meeting all the above eligibility criteria of the institute at the time of physical document verification, reporting, and admission at the institute.

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