



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

**Ref.No. NIT-N/ADVT/Research/0002/2022 dated 04/11/2022**

### **A. Ph.D. PROGRAMME**

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

<b>Sl. No.</b>	<b>Department</b>	<b>Specialization/ Area of Research/ IR domain</b>	<b>Eligible Disciplines</b>
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.	B. Tech. in Civil Engineering, M. Tech. in relevant discipline
2.	Computer Science and Engineering	Data Analytics, Artificial Intelligence, Machine Learning, Deep Learning, Bioinformatics, Online Social Networks, Computer Networks, Wireless Communication and Networks, IoT, Mobile Communications, Device to Device Communication, Vehicular Ad-Hoc Network, Public Safety Network, Image Processing, Information and Cyber Security, Block chain, Biomedical Image Processing, Data Mining, Stock Market Prediction using Machine Learning and Deep Learning, Multimedia Hashing.	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	Operation of Distribution Systems, Operation of Grid Connected Microgrids, Operation of Islanded Micro grids, Impact of G2V on the Distribution System, Smart Grid Technology, Machine Learning Technique for Power Systems, Power Network Protection, Storage and Micro Grid Technology, Synchro phasor Technology Applications, Electricity markets, Power System Analysis & Control, Hybrid AC-DC micro grids, Power System Analysis, Dynamics & Control, High Voltage AC/DC systems and FACTS, Smart Grid and Renewable Integration, Network	B.E./B. Tech., M.E./M.Tech. in Electrical and Electronics, Electronics and Communication, Electronics and Instrumentation Engineering equivalent / relevant discipline.

		<p>Reconfiguration, Condition monitoring of Power apparatus, Service Restoration, Congestion Management.</p> <p>Power Electronics, Power System Stability, Power System Deregulation.</p> <p>Renewable Energy Systems, Forecasting / Predictive analytics, Optimization, Micro Grid, Machine Learning and Deep Learning, Internet of Things, Smart Grids, Artificial Intelligence for Health Care Systems, Micro Electro Mechanical Systems (MEMS), MEMS Energy Harvesters, Bio-Medical Applications, Self-Cleaning Technology for Solar Panels, Nano Structures.</p> <p>Control System, Optimization, Biomedical instrumentation and Control, Biomedical image processing, Estimation, Control design for power system, Control design for Microgrid, PV system and Wind energy system, Control design for Power Converters and Filters, Machine Learning, Soft Computing Control development for robotic vehicles.</p> <p>Artificial Intelligence for Machinery Maintenance, Wind Farms, Industrial Internet of Things, IoT based Industrial Automation, Power System Fault Analysis, IoT for Smart Grids, AI for Medical Applications, Electric Vehicles, AI for Educational Systems, Wireless Sensor Networks, Micro Grids, Machine Learning Applications in Power Systems, Smart Transportation Systems, Automotive Applications, Sustainable Systems, Instrumentation Design.</p> <p>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.</p>	
4.	Electronics and Communication Engineering	Semiconductor device modelling, Optoelectronic devices, Photovoltaic devices, Nanoelectronics, Gas sensors, Memory devices, Speech Processing, Antenna Design and Digital Image Processing, Medical Electronics.	B.E/B.Tech., M.E/M.Tech in Electronics and Communication Engineering, Electrical Engineering,

		VLSI, Circuits and Systems, MEMs, Semiconductor Device Modelling and Simulations, Optoelectronic Devices and Displays, Photodetectors, Sensors, Power Devices, Compound Semiconductors and High-Speed Devices, Memory Devices, Neuromorphic Devices, Flexible electronic devices, Nanotechnology, Low power devices and circuits, Photovoltaic devices, Organic electronics, Optoelectronics	Instrumentation Engineering, Nanotechnology and Allied Branches.
5.	Electronics and Instrumentation Engineering	<p>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.</p> <p>Artificial intelligence, Machine learning, Deep learning, Network anomalies detection using AI algorithms, Resource management using Fog/IoT systems.</p> <p>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.</p> <p>Optoelectronic Instrumentation, Fiber optic communication, Optical sensors and system design, Labview based Virtual Instrumentation design.</p>	<p>B.E./B. Tech., M.E./M.Tech. in Electronics and Instrumentation Engineering, Electrical and Electronics Engineering, Electronics and Communication Engineering or equivalent/relevant discipline.</p> <p>Instrumentation, Industrial Instrumentation, Process Control, Fiber Optics and Laser Instrumentation, Control systems, Power Electronics, Electrical Engg., Electronics Engg., Electrical drives, Embedded Systems, Applied Electronics, Communication Systems, Communication Engineering, Communication Networks, VLSI, Signal Processing, MEMS, Microfluidics, or relevant/ equivalent discipline.</p>
6.	Mechanical Engineering	Advanced Manufacturing, CAD/CAM/CIM, Mechatronics and Automation, Material Science: Composites and Alloys, Soft Computing and Optimization, Power Plant Engineering, Biomass, Tribology, Biodiesel.	

7.	Science & Humanities (Mathematics, Physics, Chemistry)	<p><b>MATHEMATICS:</b> Optimization Theory, Cooperative Game Theory, Stochastic and Differential Game, Supply chain Network, Abstract Algebra, Ring and Module Theory.</p> <p><b>PHYSICS:</b> Nanomaterials, Nanomagnetism, Thin Film Technology, Material science, Membrane Science &amp; Technology.</p> <p><b>CHEMISTRY:</b> Areas of Interest: Applied Organic Catalysis, Enantioselective synthesis, Self- Assembly and Supramolecular chemistry, Green organic synthesis, Functional materials &amp; Hybrid composite materials, Chemical Dynamics, Environmental Chemistry, Bioinorganic and Biophysical Chemistry</p>	<p>MSc in Mathematics/ MSc in Statistics/ Operation research.</p> <p>MSc Physics/ Masters in Physical Sciences/Engineering or allied field.</p> <p>MSc in Chemistry.</p>
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### **INTERDISCIPLINARY RESEARCH TOPICS**

Machine Learning for Predictive Analytics, Wireless Sensor Networks, Application of image processing and graph theory in Power System, IOT application in Energy system, Optimization in Supply Chain Management, Mechanical Design, Kinematics and Dynamics Study of Different Robots, Optimization and Modelling Nano-Devices, AI for Educational Systems, Modelling of Sensor Networks, MEMS Biosensor Design and MEMS renewable energy systems, Wireless assisted IOT, Optoelectronics, Semiconductor Devices, Nanostructure Fabrication, Semiconductor Device Modelling, Nanostructure Surface Analysis.

### **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 OR CGPA/CPI of 6.5 on a scale of 10 or above or aggregate percentage > 60 % (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 OR CGPA/CPI of 6.5 on a scale of 10 or above or aggregate percentage > 60 % (55% marks for SC/ST candidates).
3. Master's degree in Engineering / Technology with Master degree in Computer Application with a minimum First class OR CGPA/CPI of 6.5 on a scale of 10 or above or aggregate

percentage > 60 % (55% marks for SC/ST candidates).

4. MBBS with a Master degree with a minimum First class OR CGPA/CPI of 6.5 on a scale of 10 or above or aggregate percentage > 60 % (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 a minimum First class OR CGPA/CPI of 6.5 on a scale of 10 or above or aggregate percentage > 60 % (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 but scholarship will be provided to only to candidates with valid GATE score.

### **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 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).

**Note:** 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.

## **B. OTHER GUIDELINES**

- Candidates applying for Ph.D. Programme/ Integrated Ph.D. Programme can apply through the downloaded application form only.
- Integrated Ph.D. Programme 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. 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.
- Preference will be given to those candidates who are having valid GATE / NET score.
- 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 reach the office of the **Associate Dean (R&C), National Institute of Technology Nagaland, Chumukedima – 797 103, Nagaland, by Registered Post only on or before 05-12-2022 by 4.00 p.m.**

The Rules and Regulations of Ph.D. Programme and Integrated Ph.D. Programme may be downloaded from the given link below:

<http://nitnagaland.ac.in/index.php/academics/rules-and-regulations>

**Note:**

**Only full-time candidates with GATE score / UGC NET including lectureship (Assistant Professorship) in order of merit will be considered for institute scholarship subject to the availability of funds from MoE. Others are not eligible for scholarships.**

**REGISTRAR**