



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

**Ref.No. NIT-N/ADVT/Research/0002/2021 dated 07/10/2021**

## **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, S&H (Mathematics and Physics (**There is no opening for Chemistry and Sociology**)) and Inter-disciplinary Research (IR). The Departments and areas in which the following Programmes will be offered.

<b>SL. NO.</b>	<b>DEPARTMENT</b>	<b>SPECIALIZATION/ AREA OF RESEARCH</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.	
2.	Computer Science and Engineering	Data Analytics, Machine Learning, Deep Learning, Bioinformatics, Online Social Networks, Computer Networks, Wireless Communication and Networks, IOTs, Mobile Communications, Image Processing, Information Security, Biomedical Image Processing, Data Mining, Stock Market Prediction using Machine Learning and Deep Learning, Multimedia Hashing.	
3.	Electrical and Electronics Engineering	Power Systems, Smart Electric Grids, Demand Side Management, Internet of Things, Electric Vehicles: PEV/PHEV in Smart Distribution grid, Power Systems Protection, Applications of Machine	

	<p>Learning and Deep Learning in Power Systems.</p> <p>Renewable Energy Systems, Micro Grid and Smart Grids, Power Systems, Forecasting / Predictive analytics, Machine Learning and Deep Learning, Internet of Things.</p> <p>Industry 4.0, IoT based Industrial Automation, IoT for Smart Grids, Artificial Intelligence for Medical Applications, Artificial Intelligence for Machinery Diagnostics, Smart Transportation, Smart City, Electric Vehicles, Artificial intelligence for Educational Systems, Wireless and Sensor Networks, Applications of Signal Processing.</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 and Deep Learning in control perceptive, Control development for robotic vehicles.</p> <p>Power Systems, Power System operation control and Stability, Relay Coordination, Deregulated Power System, Application of IoT and Machine Learning for Smart Grid,</p> <p>Service Restoration and Distribution Network Reconfiguration, Grid Integrated Renewable Energy</p>	
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4.	Electronics and Communication Engineering	<p>Semiconductor device modelling, Optoelectronic devices, Photovoltaic devices, Nanoelectronics, Gas sensors, Memory devices, Speech Processing, Antenna Design and Digital Image Processing, Medical Electronics. 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</p>	
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, MEMS renewable energy systems.</p> <p>Energy efficient schemes for effective cluster-head selection and routing of WSN assisted IoT, Health data analysis using machine learning / deep learning, Network anomalies detection using AI algorithms, Resource management using Fog/IoT systems.</p> <p>Artificial intelligence, Machine learning, Deep learning, Robotics and automation, Biomedical image processing, Smart distributed sensor networks, Image and video processing, IoT based Industrial Automation, Microfluidics,</p>	

		<p>Radio Frequency MEMS, Cantilever beam-based bio sensors, lab on chip technology, Flow sensor less flow measurement and control using IEEE P1451.4.</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>Enhanced Thin Film Flexible Bio-Transducer (TFFB) utilizing Thermistor/Thermocouple for biological measurement.</p> <p>Finite Realization and Analysis of probe type cantilever-based vibration MEMS device using thin film PZT.</p> <p>Aggrandized Biosensing mechanism for cancer cell detection and risk scrutinization with integrated passive/active techniques. WSN, Embedded Systems, MEMS and IOT.</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 (Physics and Mathematics Only)	<p><b>PHYSICS:</b> Nanomaterials, Nanomagnetism, Thin Film Technology, Material science, Membrane Science &amp; Technology,</p> <p><b>MATHEMATICS:</b> Optimization Theory,</p>	<p>MSc in Physics / MSc in Mathematics/ Masters in Physical Sciences/Engineering or allied field. M.Sc in Statistics/ Operation research</p>

		Cooperative Game Theory, Supply chain Network, Abstract Algebra, Ring and Module Theory.	
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**LIST OF INTERDISCIPLINARY RESEARCH AREAS**

<b>SL. NO.</b>	<b>Research Areas</b>	<b>Eligible Disciplines</b>	<b>Proposed faculty members for collaboration</b>
<b>1.</b>	Wireless sensor network, IoT based Industrial Automation, Health data analysis using machine learning/ deep learning	M.Tech in Electrical Engineering / Electrical and Electronics Engineering / Electrical and Instrumentation Engineering / Electronics and Instrumentation Engineering / Instrumentation and Control Engineering / Instrumentation Engineering / Electronics and Communications or Telecommunication Engineering / Control Engineering / Applied Electronics / Medical Electronics / Computer Science and Engineering / and Equivalent....	Name of the faculty: Dr. R. Kumar Department: EIE
			Name of the faculty: Dr. M. Prakash Department: EEE
<b>2.</b>	Artificial intelligence, Machine learning, Deep learning, Mobile Ad Hoc network, Smart distributed sensor networks, Robotics and automation, Image and video processing, Biomedical image processing. Artificial Intelligence in MEMS Design	M.Tech in Electrical Engineering / Electrical and Electronics Engineering / Electrical and Instrumentation Engineering / Electronics and Instrumentation Engineering / Instrumentation and Control Engineering / Instrumentation Engineering / Electronics and Communications or Telecommunication Engineering / Control Engineering / Applied Electronics / Medical Electronics / Computer Science and Engineering / and Equivalent....	Name of the faculty: Dr. R. Kumar Department: EIE
			Name of the faculty: Dr. Dushmanta Kumar Department: EEE
<b>3.</b>	Composite Materials and Alloys	M. Sc. in Physics/ B. Tech. and M. Tech in Mechanical Engineering and allied branches.	Name of the faculty: Dr. Thingujam Jackson Singh Department: Mechanical Engineering

			Name of the faculty: Dr. J.P. Borah Department: Science and Humanities (Physics)
4.	Composite Materials and Alloys	M. Sc. in Physics/ B. Tech. and M. Tech in Mechanical Engineering and allied branches.	Name of the faculty: Dr. Rosang Pongen Department: Mechanical Engineering
			Name of the faculty: Dr. J.P. Borah Department: Science and Humanities (Physics)
5.	Mechatronics, Dielectric materials and Power Plant Engineering.	B. Tech. and M. Tech in Mechanical Engineering/ EEE and allied branches.	Name of the faculty: Dr. Thingujam Jackson Singh Department: Mechanical Engineering
			Name of the faculty: Dr. M. Prakash Department: EEE
6.	Mechatronics and Automation; Electric Vehicle (EV)	B. Tech. and M. Tech in Mechanical Engineering/ EEE and allied branches.	Name of the faculty: Dr. Rosang Pongen Department: Mechanical Engineering
			Name of the faculty: Dr. B. Shakila Department: EEE
7.	Bio Mass and Bio Fuels	B. Tech. and M. Tech in Mechanical Engineering/ EEE and allied branches.	Name of the faculty: Dr. Rosang Pongen Department: Mechanical Engineering
			Name of the faculty: Dr. M. Prakash Department: EEE
8.	Modelling and simulation of mechanical System.	B. Tech. and M. Tech in Mechanical Engineering/ EEE and allied branches.	Name of the faculty: Dr. Amit Kumar Singh Department: Mechanical Engineering

			Name of the faculty: Dr. M. Prakash Department: EEE
9.	Artificial Intelligence based control on mechanical System.	B. Tech. and M. Tech in Mechanical Engineering/ EEE and allied branches.	Name of the faculty: Dr. Amit Kumar Singh Department: Mechanical Engineering
			Name of the faculty: Dr. B. Shakila Department: EEE
10.	Application of Artificial Intelligence in Manufacturing.	B. Tech. and M. Tech in Mechanical Engineering/ EEE and allied branches.	Name of the faculty: Dr. Amit Kumar Singh Department: Mechanical Engineering
			Name of the faculty: Dr. Dushmanta Kumar Das Department: EEE
11.	Material Disposition on Alloy/composite substrates and their Characterization.	B. Tech. and M. Tech in Mechanical Engineering/ Electronics and Communication Engineering and allied branches.	Name of the faculty: Department: Dr. Amit Kumar Singh. Mechanical Engineering
			Name of the faculty: Dr. Jay Chandra Dhar. Department: ECE
12.	IoT based smart agricultural monitoring system using image processing	B. Tech. and M. Tech in CSE / IT / EEE and allied branches.	Name of the faculty: Dr. Arambam Neelima Department: CSE
			Name of the faculty: Dr. B. Shakila Department: EEE
13.	Application of deep learning techniques in autonomous drone navigation system	B. Tech. and M. Tech in CSE / IT / EEE and allied branches.	Name of the faculty: Dr. Arambam Neelima Department: CSE
			Name of the faculty: Dr. B. Shakila Department: EEE
14.	Application of Artificial Intelligence in Supply Chain Management,	Master degree in Mechanical Engineering and Allied discipline, Master degree in Mechanical Engineering, Electrical Engineering, Electrical	Name of the faculty: Dr. Dushmanta Kumar Das Department: EEE
			Name of the faculty:

	Industrial Management	and Electronics, Engineering, Electronics and Communication, Engineering Electronics and Instrumentation Engineering, All Mechanical and Electrical, Allied discipline, Computer Science Engineering, Information Technology and its Allied Branch	Amit Kumar Singh Department: Mechanical Engineering
15.	Robotics and Automation (Mechanical design, Modeling, Inverse Kinematics, Dynamics and control design)	Master degree in Mechanical Engineering, Electrical Engineering, Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering, All Mechanical and Electrical Allied discipline	Name of the faculty: Dr. Dushmanta Kumar Das Department: EEE
			Name of the faculty: Amit Kumar Singh Department: Mechanical Engineering
16.	Application of Artificial Intelligence and Machine Learning for mechanical systems & In-service Inspection	Master degree in Mechanical Engineering and Allied discipline	Name of the faculty: Dr. Dushmanta Kumar Das Department: EEE
			Name of the faculty: Dr. Jay Chandra Dhar Department: ECE
17.	Nano Devices modeling, simulation and optimization	Master degree in Electrical Engineering, Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering, All Electrical and Electronics Allied disciplines	Name of the faculty: Dr. Dushmanta Kumar Das Department: EEE
			Name of the faculty: Dr. Jay Chandra Dhar Department: ECE
18.	Artificial Intelligence in VLSI, Network on Chip, etc	Master degree in Electrical Engineering, Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering, Computer Science Engineering, Information Technology and its Allied Branch, All Electrical and Electronics Allied disciplines	Name of the faculty: Dr. Dushmanta Kumar Das Department: EEE
			Name of the faculty: Dr. Jay Chandra Dhar Department: ECE



19.	Machine Learning for Predictive Analytics	M.Tech in Computer Science and Engineering/Information Technology/ Electrical Engg./Electrical and Electronics Engg./ Electrical and Instrumentation/Communication Engineering (or any other degree relevant to the above disciplines)	Name of the faculty: Dr. J. Arul Valan Department: CSE
			Name of the faculty: Dr. M. Prakash Department: EEE
20.	Deep Learning for Medical Applications	M.Tech in Computer Science and Engineering/ Information Technology/ Electrical Engg./Electrical and Electronics Engg./ Electrical and Instrumentation/ Communication Engineering / (or any other degree relevant to the above disciplines)	Name of the faculty: Dr. J. Arul Valan Department: CSE
			Name of the faculty: Dr. M. Prakash Department: EEE
21.	Security Issues in Internet of Things (IoT)	M.Tech in Computer Science and Engineering/ Information Technology/ Electrical Engg./Electrical and Electronics Engg./ Electrical and Instrumentation/ Communication/ (or any other degree relevant to the above disciplines)	Name of the faculty: Dr. J. Arul Valan Department: CSE
			Name of the faculty: Dr. M. Prakash Department: EEE
22.	Block Chain Technology	M.Tech in Computer Science and Engineering/ Information Technology/ Electrical Engg./Electrical and Electronics Engg./ Electrical and Instrumentation/ Communication Engineering / (or any other degree relevant to the above disciplines)	Name of the faculty: Dr. J. Arul Valan Department: CSE
			Name of the faculty: Dr.M.Prakash Department: EEE
23.	Cyber Security	M.Tech in Computer Science and Engineering/ Information Technology/ Electrical Engg./Electrical and Electronics Engg./ Electrical and Instrumentation/ Communication Engineering / (or any other degree relevant to the above disciplines)	Name of the faculty: Dr. J. Arul Valan Department: CSE
			Name of the faculty: Dr.M.Prakash Department: EEE
24.	Image recognition for online fault identification of power equipment.	M.Tech in Computer Science and Engineering/ Information Technology/ Electrical Engg./Electrical and Electronics Engg./ Electrical and Instrumentation/ Communication	Name of the faculty: Dr.Dipu Sarkar Department: EEE
			Name of the faculty: Dr.Arambam

		Engineering / (or any other degree relevant to the above disciplines)	Neelima Department: CSE
25.	Application of Graph theory in Power system	M.Tech in Computer Science and Engineering/ Information Technology/ Electrical Engg./Electrical and Electronics Engg./ Electrical and Instrumentation/ Communication Engineering / (or any other degree relevant to the above disciplines)	Name of the faculty: Dr.Dipu Sarkar Department: EEE
			Name of the faculty: Dr.Arambam Neelima Department: CSE
26.	IoT based Industrial Automation  Smart Vehicles	Master's degree in Engineering / Technology with Bachelor's degree in Engineering / Technology / MS by Research in Engineering / 5 year integrated Masters/ Dual Degree in Engg. or BS+MS (5-year integrated course) from CFTI. (in areas of EEE/EIE/CSE/IT/ECE/ Mechatronics / Mechanical)	Name of the faculty: Dr.D.Ganga Department: EEE
			Name of the faculty: Department: EIE Dr.R.Kumar
27.	Predictive Analytics for Automation Technologies, Industrial Internet of Things	Master's degree in Engineering / Technology with Bachelor's degree in Engineering / Technology / MS by Research in Engineering / 5 year integrated Masters/ Dual Degree in Engg. or BS+MS (5-year integrated course) from CFTI (in areas of EEE/ECE/EIE/CSE/IT/Mechatronics/Mechanical/ Civil)	Name of the faculty: Dr.D.Ganga Department: EEE
			Name of the faculty: Dr.Arambam Neelima Department: CSE
28.	Deep Learning for Medical Imaging	Master's degree in Engineering / Technology with Bachelor's degree in Engineering / Technology / MS by Research in Engineering / 5 year integrated Masters/ Dual Degree in Engg. or BS+MS (5-year integrated course) from CFTI (in areas of EEE/ECE/EIE/CSE/IT/Biomedical)	Dr.D.Ganga Department: EEE
			Dr.Arambam Neelima Department: CSE
29.	Biosensors	Master's degree in Electronics Engineering / Technology/Master's degree in	Name of the faculty: Dr. P. Chinnamuthu Department: ECE

		Bioelectronics / Physics/ Chemistry / Biochemistry/ Biotechnology/ Material Science / Nanotechnology	Name of the faculty: Dr. Jhimli Bhattacharyya Department: Science & Humanities (Chemistry)
30.	Advanced functional materials	Master's degree in Electronics Engineering / Technology/Master's degree in Physics/ Chemistry/Material Science / Nanotechnology	Name of the faculty: Dr. Naorem Khelchand Singh Department: ECE
			Name of the faculty: Dr. Jhimli Bhattacharyya Department: Science & Humanities (Chemistry)

### **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 AND HUMANITIES**

Master's degree in Science/Humanities/ME/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)

## **B. INTEGRATED Ph.D. PROGRAMME**

Applications are also invited from qualified candidates for admission to Integrated Ph.D. Programme in the disciplines of CE, EEE, EIE, ECE, ME and CSE for the above-mentioned specialization/area.

### **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.

**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.

## **C. 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.
- If anyone requires to apply for more than one specialization, he / she should apply separately for each specialization with the same 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, Dimapur**) should reach the office of the Associate Dean (R&C), National Institute of Technology Nagaland, Chumukedima, Dimapur – 797 103 on or before 07-11-2021 by 4.30 p.m.

The Rules and Regulations of Ph.D. Programme and Integrated Ph.D. Programme shall be downloaded from the Webaddress:

<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 MHRD. Others are not eligible for scholarships.**

**REGISTRAR**