INFORMATION BROCHURE

Ph.D. Programme

WINTER SEMESTER (DECEMBER) ADMISSIONS 2025

National Institute of Technology Calicut
(An Institution of National Importance)
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Part- I PROFILE OF THE INSTITUTE

1. Introduction

National Institute of Technology Calicut (an Institution of National Importance) is one of the premier National institutions for technical education in India. This was originally established in September 1961 as "Calicut Regional Engineering College (CREC)", jointly by the Government of India and the Government of Kerala. The Ministry of Education (formerly Ministry of HRD), Government of India elevated CREC to a Deemed University under the name National Institute of Technology Calicut (NITC) in June 2002. NIT Calicut is an academically autonomous Institute of National Importance fully funded by the Government of India and is administered by the National Institutes of Technology Act, 2007. The President of India is the visitor to the Institute under the Act. The governance structure includes the National Council for NITs as the apex policy making body, while the Institute's governance is vested with a Board of Governors. Institute's senate is the authority in academic matters. Chairman of the Board of Governors is nominated by the visitor. NITC offers academic programmes leading to B.Tech., B.Arch., M. Tech., M. Plan., M.Sc., MBA and Ph.D. degrees in various disciplines. NITC is a recognized Quality Improvement Programme (QIP) Centre for offering M. Tech. and Ph.D. programmes for faculty members of Engineering/Architecture and Planning Colleges & Polytechnics. The institute is a recognized research institution for pursuing research work leading to Ph.D. degree under the National Doctoral Fellowship Scheme. NITC has well qualified faculty and dedicated supporting staff. Apart from teaching, NIT Calicut is engaged in a wide spectrum of activities covering research and development, industrial consultancy, continuing education to faculty/staff, and community development.

2. Location

Set in a picturesque landscape at the foothills of the Western Ghats, NIT Calicut is located about 22 kilometers north-east of Kozhikode city in the state of Kerala, India. Calicut, also known as Kozhikode, located in the Malabar region of Kerala State, found a place in the world history with the discovery of a sea route to India in 1498 by the Portuguese navigator Vasco Da Gama. Basking in the idyllic setting of the Arabian Sea on the west and the proud peaks of the Wayanad hills on theeast, Calicut is known for its serene beaches, lush green countryside, historic sites, calm backwaters, wildlife sanctuaries, rivers and waterfalls. The campus of National Institute of Technology Calicut stretches over a length of about 1.5 km along the Calicut-Mukkam Road, extending over an area of approximately 120 hectares. NITC is connected with Calicut city by KSRTC Buses (towards Mukkam) starting from KSRTC Central Bus Station and by Private Buses starting from Corporation Bus Station, Palayam (near Calicut Railway Station). The nearest airport is at Karipur, which is 45 kms from the Institute. Kozhikode railway station is 23 kilometers away from the NITC campus. Local buses are available frequently for commutation between campus and the Calicut city.

3. Computing Facilities and Campus Network

Central Computer Centre (CCC) is the central facility in NIT Calicut which caters for the computing requirements of the whole community of this institution. The center has state of the art infrastructure with four fully operational terminal rooms spanning over three floors of the building. Institute Management System(IMS) of the institute also operate from the Centre building. The Centre

has 250+ client machines and has a capacity to include 400+ machines. Client systems are of both desktop and workstation genre. Desktops contain DELL OPTIPLEX 7010, DELL Precision T3610, HP 406 Micro tower and HP Prodesk series which are of adequate performance and workstations contain Fujitsu Celsius W570 power series machines which are capable of more than handling high-end production and design level applications. CCC hosts some of the high-end servers and a parallel processing cluster machine. Servers include DELL PowerEdge T620 which has a dual Hexa-core processor, Lenovo ThinkSystem SR650 with 32GB Nvidia V100 card and HP ProLiant Rack server which has a dual quad-core processor. A state of the art HPC system with 25 Tera FLOPS computing power meet the research needs of the Institute. The facility can be accessed by all the departments and centre anywhere in the campus through networking. Computers in the CCC are loaded with Windows and Linux operating systems for convenience and centralized authentication is provided. Students are mandated to follow strict classroom discipline inside the Centre. Centre is fully air-conditioned and has UPS power backup for the whole setup. The Centre works 16 hours a day (8 am – 12 midnight), 7 days a week, except national holidays unless instructed otherwise.

The Campus Networking Centre (CNC) is the central facility providing the software, hardware and networking support to the entire student and staff community of NITC Campus. CNC manages internet connectivity (both wired and wireless), Institute website and IP phones within the campus. The campus, interconnected with about 30 kms of fiber optic backbone network with 80 routed internal networks, is managed by the Unified Threat Management System. The centre is equipped with Firewall, Routers, Domain Name Server, Web Server, Proxy Servers and IP phone server, etc. Presently the network is served by 2Gbps of Internet connectivity provided by BSNL (1 Gbps under NKN scheme of MoE). CNC functions on a 24x7 basis, 365 days without any holidays. IP phones are installed in all Academic and Administrative sections. The IP Phones and IP Phone server are also implemented, configured and managed by CNC.

4. Library Facilities

The Central Library of NIT Calicut is one of the best technical libraries in South India. It came into being with the establishment of the college in 1961. The library has a very good collection of more than one lakh technical/scientific books. Central Library offers its services to more than 8,000 users comprising of undergraduate, postgraduate students, research scholars, faculty and employees from various Departments/Centre/ Sections of the Institute. The services of the Central Library are fully automated using KOHA, and the entire collection is accessible throughout the campus. Using KOHA OPAC, users can search the online library catalogue by Author, Title, Subject and Keywords. The library management software along with the existing campus-wide intranet imparts the following features: Automated front-desk operations, Campus-wide online access, catalogue access and RFID-based automated collection/bar-coded user identification. Central Library subscribes to reputed International Journals and Indian Journals in online and print forms. The Digital Library, 'NALANDA' provides online access to more than 6000 electronic journals in various Engineering and Science disciplines. NALANDA hosts many electronics databases in its servers. As a member of the Shodh Sindhu Consortium under the Ministry of Education, GOI, NALANDA promotes the use of e-journals and e-books for advanced research and learning in Engineering and Science Education. Major online resources are journal/magazine/ conference records/standards of IEE, IEEE, Springer, ASME, ASCE, and ACM Digital Library core packages. Online access to study materials is available

through a local copy of NPTEL. Resources like CMIE, ACE Analyzer, Eikon, Grammarly, Knimbus, Emerald, J Gate, Scopus, and Web of Science are available to the NITC community through the digital library. Library also subscribes to a plagiarism checker - Turnitin. The digital library is developing the NITC resources by collecting and indexing the students' project reports/theses through an ETD run with DSpace, which also houses the national and international standards. Eduserver - running in the Digital Library - hosts the Moodle platform for online course management. E-books from Wiley, Springer and Pearson are also made available.

5. Centre for Career Development

Centre for Career Development envisages to inculcate a career-oriented campus culture that moulds the undergraduate, postgraduate and doctoral research students of the Institute to pursue their academic and professional goals. Formerly this centre was known as the Centre for Training and Placement which was formed in 1988. Understanding the need for a broader role to be taken for our students, the Centre for Career Development has been formed with effect from March 2022. This Centre is functioning with the following Objectives:

- Connect the students with placement and internship opportunities;
- Educate the students on knowledge of the self, career options and resources available;
- Empower the students with skill sets required in their careers.

6. Programmes of Study

NITC offers undergraduate programmes leading to B. Tech. degree in 10 disciplines and post-graduate programmes leading to M. Tech./M. Plan degrees in various specialized streams. In addition to this, the institute offers MSc degree programmes in three streams and an MBA programme (2 years - 4 semesters). The Institute also offers facilities for research leading to Ph.D. degrees in various branches of Engineering, Science and Management. The details of B. Tech, M. Tech./M. Plan. and MSc programmes are as given below:

Under graduate Level - B. Tech. Programmes (4 years - 8 semesters)

- Biotechnology (BT)
- Chemical Engineering (CH)
- Civil Engineering (CE)
- Computer Science and Engineering (CS)
- Electrical & Electronics Engineering (EE)
- Electronics & Communication Engineering (EC)
- Energy Engineering (EN)
- Engineering Physics (EP)
- Materials Science and Engineering (MT)
- Mechanical Engineering (ME)
- Production Engineering (PE)

Under graduate Level - B. Arch. Programme (5 years - 10 semesters)

Integrated Teacher Education Programme (ITEP) – B.Sc. – B. Ed. (4 Years- 8 semesters)

Post graduate Level - M.Tech./M.Plan. Programmes (2 years - 4 semesters)

Department	Programme	Programme Code
Architecture & Planning	Urban Planning	AR61
Bioscience Engineering	Bioengineering	BT61
Civil Engineering	Structural Engineering	CE61
	Traffic & Transportation Planning	CE62
	Offshore Structures	CE63
	Water Resources Engineering	CE65
	Environmental Engineering	CE66
	Geotechnical Engineering	CE67
Chemical Engineering	Chemical Engineering	CH61
Computer Science & Engineering	Computer Science & Engineering	CS61
	Computer Science & Engineering (Information Security)	CS62
	Artificial Intelligence and Data Analytics	CS63
Electronics & Communication Engineering	Electronics Design & Technology	EC61
	Microelectronics & VLSI Design	EC62
	Telecommunication	EC63
	Signal Processing	EC64
Electrical Engineering	Instrumentation & Control Systems	EE61
	Power Systems	EE62
	Power Electronics	EE63
	Industrial Power and Automation	EE64
	High Voltage Engineering	EE65
	Electric Vehicle Engineering	EE66
Mechanical Engineering	Industrial Engineering and Management	ME61
	Thermal Sciences	ME62
	Manufacturing Technology	ME63
	Energy Engineering and Management	ME64
	Materials Science and Technology	ME65
	Machine Design	ME66
Materials Science and Engineering	Nanotechnology	MT61

M.Sc. Programmes (2 years - 4 semesters)

Department	M. Sc. Programme	Programme Code
Mathematics	Mathematics	MA62
Physics	Physics	PH62
Chemistry	Chemistry	CY62

MBA Programmes (2 years - 4 semesters)

Executive M.Tech Programme in Sustainable Electrical Energy (3 years)

7. Major Areas of Research and Consultancy

The major areas of research and consultancy of various departments/Centre are as follows:

A. ARCHITECTURE AND PLANNING

- Urban and Regional Planning
  - Transportation
  - Infrastructure
  - Housing
  - Environmental Planning
  - Planning Informatics
  - Disaster Management &Climate Change
  - Smart Cities planning
  - Energy & Sustainability studies
  - Heritage conservation and Tourism Management
  - Geospatial Technology
- Architecture
  - Urban Design
  - Landscape
  - Conservation
  - Architectural Theory
  - Architectural Visualization & Product Design
  - Pedagogy
  - Sustainable Architecture
  - AI and machine learning applications in architectural design
  - Generative and parametric design
  - VR and AR in architectural pedagogy
- Landscape Planning and Design
  - Landscape Urbanism
  - Wetland Studies
  - Ecological Assessments

- Human Ecology
- Environmental History
- Cultural Landscape

- Building Technology & Management
  - Building Services
  - Energy Modelling
  - Building Information &Modelling
  - Alternate Building Materials
  - Construction Management
  - Modern Methods of Construction
  - Change Management
- Structural Engineering
  - Masonry Structure,
  - Seismic Safety of Structures
  - Sustainable Strengthening Techniques,
  - Structural Dynamics &Earthquake Engineering,
  - Sustainable Concrete
  - Reinforced concrete structure
  - Bio concrete
  - Computational Mechanics

B. BIOSCIENCE AND ENGINEERING

- Enzyme Technology
- Microbiology
- Bioprospecting
- Cancer Research
- Bioinformatics and Computational Biology
- Gene Regulation
- Molecular genetics
- Machine Learning and Network biology
- NGS data analysis for Precision Medicine
- Protein Folding
- Protein Engineering
- Genetic Engineering
- Biomodelling and Drug Design
- Neurobiology
- Immunology
- Cell engineering
- Cytoskeleton and Motor proteins
- Biophysics
- Bio-Nano Engineering
- Biomaterial and Tissue engineering

- Regenerative medicine
- Bioinspired materials
- Supramolecular chemistry and extremozymes
- Plant genomics and biotechnology
- Environmental bioengineering
- Micro/nanofluidics

C. CHEMICAL ENGINEERING

- Reaction and Bioprocess engineering
  - Bio-materials
  - Biofuels
  - Catalysts
  - Fermentation Technology
  - Bioreactors
- Energy and Electrochemical Engineering
  - Electrochemical systems
  - Fuel Cells
  - Phase Change Heat transfer
- Materials Science and Engineering
  - Carbon-based materials
  - Nano –composites
  - Polymers and polymer Composites
  - Soft Matter
- Process Control, Optimization and systems Engineering
  - Flow Assurance in Oil and Gas Pipelines
  - Process Intensification
  - Rheology
  - Optimization under uncertainty
  - Supply chain optimization
- Process Modelling, Simulation, CFD and Theoretical computation
  - Machine Learning
  - Molecular Simulations
  - Multiphase Flow Modelling
  - Non-Newtonian Fluid Dynamics
  - Thermodynamic Modelling
  - Hydrodynamic instability
- Environmental Engineering
  - Carbon Capture and Storage
  - Desalination
  - Membrane Separation
  - Microfluidics
  - Wastewater Treatment
- Thermal Science and Engineering

- Micro/Nanoscale phase change heat transfer
- Passive vapor generation systems
- Phase Change material for a thermal energy storage system
- Heat Transfer Enhancement
- Energy Device and System

D. CHEMISTRY

- Bioinorganic Chemistry
- Bioinspired Catalysis
- Biomimetic Inorganic Chemistry
- Energetic Materials/ High Energy Materials
- Heterocyclic Chemistry
- Main Group Organometallic Materials and Supramolecular Chemistry
- Materials Chemistry & Technology (Polymers, Biomacromolecules, Blends, Composites, Membranes)
- Medicinal Chemistry
- Organic & Bio-organic Chemistry
- Organic Synthesis and Catalysis
- Porphyrins and Metalloporphyrins
- Soft Materials
- Theoretical and Computational Chemistry
- Thermoelectric Materials
- Waste Management

E. CIVIL ENGINEERING

- **Structural Engineering**

  Structural Concrete: Mechanics of Reinforced and Pre-Stressed Concrete; Strut-And-Tie Model Based Design

  Computational Mechanics: FEA and CFD of structures, Computational Structural Stability, Computational Material Modelling, Fracture Mechanics, Meshfree and Boundary Element Methods

  Structural Dynamics & Earthquake Engineering: Seismic Safety of Structures, Structural Dynamics, Resilience and Robustness of Structures, Performance based Earthquake Engineering, Condition assessment and Structural Health Monitoring, Vehicle-Tire-Pavement Interaction Studies

  Steel and Metal Structures: Hot-rolled Steel Structures, Thin-walled structures, Buckling and Structural Stability, Plates, Shells and Spatial Structures, Aluminium Structures

  Application of AI and ML: Structural Control and Health Monitoring: Smart Structures and Sensors, Vibration and Buckling Control

  Retrofitting and Rehabilitation: Non–destructive Techniques for Structural Assessment, Residual Service Life Estimation, Heritage Conservation

Bridge Engineering

Pre-stressed Concrete Structures: High-Speed Railway Sleepers

Structural Reliability

Structures under Extreme Loads: Blast, Flood, Cyclone, Landslide, Fire, Impact etc, Fatigue Life Assessment of Structural Members, Progressive Collapse Analysis, Structural Risk Assessment

Architected materials: Meta Materials, Origami Structures, Auxetic Materials, Bioinspired Structures

Composite Materials and Structures: Fiber reinforced Polymers, Functionally Graded Materials, Honey Combed Structures, Steel Concrete Composite Structures, Smart Materials and Structures

Energy Harvesting

- **Offshore Structures**

  Coastal Engineering: Coastal Erosion & Protection, Sediment Transport & Beach Nourishment, Coastal Protection Structures, Coastal Flooding & Storm Surge Modelling, Port & Harbour Engineering, Coastal Zone Management & Climate Resilience

  Offshore Engineering: Fixed Offshore Structures (Offshore Jacket Structures), Floating Offshore Structures (TLPs, Semi-submersibles, Spars, FPSOs, Novel Geometries), Mooring & Riser Systems, Subsea Engineering (pipelines, manifolds, umbilical), Offshore Safety & Reliability Engineering

  Blue Renewable Energy: Wave Energy Converters (WECs), Integration of WECs with Coastal & Offshore Structures, Offshore Wind Energy (Floating & Fixed Turbines Supporting Platforms), Ocean Thermal Energy Conversion (OTEC)

  Naval Architecture: Hull form optimization (resistance, seakeeping, manoeuvrability), Computational Fluid Dynamics (CFD) applications in ship design, Ship stability and dynamic response analysis, Advanced shipbuilding materials (composites, aluminium, high-strength steel), Ship Propulsion dynamics

- **Traffic and Transportation Planning**

  Transport Planning: Travel demand modelling, Comprehensive mobility planning, Public transportation planning, Transit terminal planning, Planning for vulnerable users, Freight demand modelling, Transport policy development, Transportation infrastructure planning and development, Resilience of transportation infrastructure

  Traffic Engineering: Traffic engineering and management, Road user behaviour, Capacity and level of service of traffic facilities, Traffic safety analysis and modelling, Intelligent transportation systems

  Pavement Technology: Pavement materials, Alternative materials for pavement construction, Viscoelastic and chemical characterization of binders, Bio-binders, Design of pavements, Functional and structural valuation of pavements

  Allied Areas: GIS applications in transportation engineering, Inland water transportation, Application of UAVs in transportation engineering, Application of AI/ ML in transportation engineering, Application of Virtual Reality/ Computer Vision in transportation engineering

- **Geotechnical Engineering**

  Soil Mechanics and Characterization: Unsaturated Soil Mechanics, Bio and Nano Geotechnolgy, Geosynthetics and Soil Interaction, Ground Improvement Techniques, Advanced Soil Testing, Marine and pavement geotechnics

Foundation Engineering: Sustainable Foundations, Earth retaining structures, Slope Stability and Landslide Analysis, Pavement Geotechniques, Foundations for Offshore Wind Turbines, Performance-Based Foundation Design, Machine Foundations

Geotechnical Earthquake Engineering: Liquefaction Mitigation and dynamic characterisation, Seismic Response of soil slopes and Earth retaining Structures, Shear wave velocity profiles and ground response analysis; development of seismic zonation and response spectra, Soil-Structure Interaction

Geo-Environmental Engineering: Waste Containment and Engineering Landfill Design, Soil Remediation, Geosystems for Carbon Sequestration

Computational and Data-Driven Geotechnics: Advanced Numerical Modelling, Discrete Element Method (DEM), Machine Learning and AI, Digital Twins for Geohazard management

Underground Space technology: Rock Mechanics, Tunnelling in weak rock masses, Support systems, Rock mass characterization

- **Water Resources Engineering and allied areas**
- **Environmental Engineering**
  Water and wastewater treatment, Low-cost treatment methods, Emerging Contaminants and micropollutants, Air pollution and control, Indoor air quality, Solid waste management, Waste to resource conversion and circular economy, Land and groundwater remediation, Biomining and Bioleaching, Environmental Microbiology, Environmental Forensics, Environmental Risks, Environmental Modelling
- **Building Technology and Construction Management**
  Alternate Construction Materials, Sustainable Concrete and Strengthening Techniques, Concrete for Special Applications and Systems, Geopolymer Concrete, CO 2 Sequestration in Construction Materials, Valorization of Agro-Industrial By-Products and C& D Wastes, Precast and Prefabricated Structures, Accelerated and unreinforced / reinforced Masonry, Durability of Concrete Structures, Life Cycle Assessment, Rebar Corrosion Control Strategies, Cathodic Protection Systems for Corrosion Mitigation, 3D Printing of cementitious systems, High-Speed Railway Sleepers, Coastal Protection Structures, Disaster resistant construction, Molecular Modeling of Cementitious Materials, Electrochemical Modelling of Steel-Cementitious Systems
- **Town Planning**
- **Geomatics Engineering**
- **Applied Geology**

F. COMPUTER SCIENCE & ENGINEERING

- Algorithms and complexity
- Bioinformatics
- Cloud Computing
- Compilers and Programming Languages
- Computer Architecture
- Database Management Systems
- Distributed Computing
- Image Processing

- Information Security
- Networks
- Operating Systems
- Software Engineering
- Artificial Intelligence/Machine Learning

G. EDUCATION

- Education Psychology
- Early childhood care and education
- Environmental education and Pedagogical practices

H. ELECTRICAL ENGINEERING

- Instrumentation and Control Systems.
- Power and Energy Systems.
- Power Electronics & Drives.
- Electric Machine Design and Analysis
- Industrial Power & Automation.
- Biomedical Signal Processing and Biomedical Instrumentation.
- High Voltage Engineering
- Electric Vehicle Engineering
- Sustainable Energy

I. ELECTRONICS & COMMUNICATION ENGINEERING

- Electronics Design and Technology
  - Embedded System Design
  - EMI/ EMC, Control System Design
  - Biomedical System Design
  - System Design for Signal Processing and Communication
  - Biomedical Imaging System Design
- Microelectronics and VLSI Design
  - Power Management in IC Design
  - Analog & Mixed-signal IC design
  - Semiconductor Device modelling
  - Micro fabrication Technology, Micro/Nano Electro Mechanical System MEMS/NEMS
  - VLSI architectures for Signal Processing and Communication
  - Photovoltaics Devices for Energy Harvesting
  - Fabrication and Modelling of Photovoltaics Devices
  - CMOS Image Sensors

- Semiconductor Memory Devices
- Photonic Integrated Circuits
- Neuromorphic Devices and Circuits
- Hardware Architectures for Deep Neural Networks
- Spintronics
- Fabrication and Characterisation of sensors based on Semiconductor oxides and Polymers

- Telecommunication
  - Wireless Communications and Networks
  - OFDM/MIMO and Massive MIMO
  - 5G & 6G Wireless Communications
  - Cryptography and Secure Communication
  - RF & Microwave Engineering
  - Coding Theory and Applications
  - Distributed Computing and Content Delivery
  - Optical Communication and Optical Wireless Communication
  - Edge Computing
  - Non-terrestrial Networks
  - Integrated Sensing & Communications
  - Cellular Connected UAV
  - Molecular Communication

- Signal Processing
  - Speech/ Audio / Image / Video Processing
  - Compressed Sensing/ Sparse Signal Processing,
  - Multi-rate Signal Processing
  - Biomedical Signal Processing
  - Radar/Array Signal Processing
  - Machine Learning, Computer Vision
  - Deep Learning
  - Statistical Signal Processing and Bayesian Machine Learning
  - Reinforcement Learning
  - VLSI Architectures for Signal Processing & Deep Learning
  - Biomedical Imaging
  - AI for Biomedical Imaging and Signal Processing
  - Medical Image Analysis

J. HUMANITIES, ARTS AND SOCIAL SCIENCES

- PhD Programme in English- Memory studies, Trauma studies, Postcolonial literature in English and English Translations
- PhD Programme in Economics- Development Economics, Labour Economics, Agricultural Economics, Mountain Economies

K. MANAGEMENT STUDIES

- Finance and Accounting
- Marketing Management
- Brand Management
- Consumer behaviour
- Grassroots Marketing
- Consumer Psychology
- Human Resource Management and Organisational Behaviour
- Behavioural Science
- Operations Management, Decision Sciences
- Data Analytics
- Information Systems
- Strategic Management
- Economics
- Health Care Management
- Public Policy and Governance
- Natural Resource Management
- Entrepreneurship
- Technology Management
- Logistics Management
- Spirituality Marketing
- Neuro Marketing
- Green Marketing
- Sustainable Marketing
- Corporate Social Responsibility (CSR) and Marketing

L. MATERIAL SCIENCE AND ENGINEERING

- Additive manufacturing materials
- Affordable Healthcare
- Amorphous metallic systems
- Applied microscopy and spectroscopy
- Biodegradable Metallic Implants
- Biomaterials
- Biosensors
- Carbon materials for energy and devices
- Computational material science
- Corrosion and Wear Resistant Coating
- Electrocatalysis

- Electrospinning
- Emerging Solar Cell Technologies
- Fuel cells
- Interferometric measurements
- Lightweight metallic systems
- Magnesium based Hydrogen storage
- Materials Informatics
- Mechanical behaviour of materials
- Medical Materials
- Metals and alloys for structural applications
- Microfluidics and Nanofluidics
- Microscale/Nanoscale heat transfer
- Multiscale numerical modelling
- Nano Composites for Energy
- Nanocomposites
- Nanocomposites and Nanosensors
- Nanofluids
- Perovskite Solar Cells
- Phase Change Materials
- Photocatalysis
- Process-Microstructure-property correlations
- Semiconductor Memories and devices
- Severe Plastic Deformation
- Solar Fuels
- Solar Thermal Systems
- Surface Modifications and Coating Techniques (Metals)
- Thermal Management of Devices (Electronics/Batteries)
- Water Splitting

M. MATHEMATICS

- Actuarial Science
- Algebraic Function Theory
- Algebraic Graph Theory
- Algebraic Topology
- Associative Rings and Algebras
- Banach Algebras
- Category theory
- Combinatorics & Graph Theory
- Commutative Algebra
- Complex Analysis
- Computational Finance

- Differential Equations
- Differential Geometry
- Fractal Geometry
- Fractional Calculus
- Functional Analysis
- Fuzzy Graph Theory
- Fuzzy Logic
- Game Theory
- Geometric Functions Theory
- Lie Algebra/Superalgebra
- Linear algebra
- Mathematical Analysis
- Matrix Theory
- Modular Forms
- Neural Network Approximation
- Nonlinear Dynamics
- Nonlinear Elliptic and Subelliptic PDEs
- Number Theory
- Numerical Analysis and Scientific Computing
- Numerical Analysis of Differential Equations
- Numerical Methods for fractional differential equations
- Numerical Methods of Singularly Perturbed Differential Equations
- Numerics of Delay and Advanced Differential Equations
- Operations Research
- Operator Theory
- Optimization
- Partition Theory
- Reliability of systems
- Set Generalizations
- Several Complex Variable
- Special Function and Function Spaces
- Spectral Graph Theory
- Stochastic Modelling and Applied Statistics
- Time Series Analysis
- Topological Data Analysis
- Topology
- Variational Analysis
- Wavelets Theory
- Wave Structure Interactions

N. MECHANICAL ENGINEERING

- **Industrial Engineering and Management**
  - Ergonomics and Product Design
  - Supply Chain Management
  - Marketing Management
  - Human Resource Management
  - Data Science Applications in Operations Management
- **Machine Design**
  - Computational Mechanics
  - Robotics
  - Tribology
  - Machine Dynamics and Vibrations
  - Nano- and Micro-mechanics
  - Product Design
  - Biomechanics
  - Nonlinear dynamics
  - Nonlinear Solid Mechanics
  - Fatigue and Fracture
- **Materials and Manufacturing**
  - Macro and Micro Machining
  - Modern Machining
  - Metrology
  - CAD/CAM
  - Composite Materials
  - Ferrous and Non-Ferrous Metallurgy
  - Materials for Electronics Application
  - Additive Manufacturing/3D printing
  - Digital Manufacturing and Design
  - Mechatronics and industrial automation
  - Materials for Sustainable Development
  - Structure-Property Correlation of materials
  - Advanced structural and functional ceramics
  - Biomaterials and surface engineering
  - Smart Materials and Smart Manufacturing
- **Thermal and Energy Engineering**
  - Renewable Energy Technologies
  - Energy Conservation
  - Fuel Cells and Hydrogen Technology
  - Computational Fluid Dynamics
  - Heat Pipes

- Cryogenics
- Jets and Flow Acoustics
- Combustion and Fire Safety
- Fluid-Structure Interactions
- Multi-phase Flows
- High Performance Computing
- Lattice Boltzmann Modeling
- High Speed Flows
- Turbo-machinery
- Internal Combustion Engines
- Convection and Radiation Heat Transfer
- Non-Newtonian flows
- Heating and Ventilation Systems
- Thermal Management
- Microfluidics

O. PHYSICS

- Organic Solar Cell
- Nanomaterials for Energy & Environmental Applications
- Organic & Hybrid Electronics & Photonics
- Photonic devices based on 2D materials, Paper-based retinomorphic photodetctors
- Nonlinear Optics and Nano Photonics
- Statistical mechanics of phase transitions – Soft condensed matter Systems
- Computational Modeling of Materials
- Climate, Atmospheric and Environmental Monitoring using principle of Optics
- Experimental Condensed Matter Physics
- Surface and Interface Science
- Diamond and Related Materials
- Oxide Thin films and Heterostructures
- Microfluidics and optofluidics
- Gravity and Black holes, Constrained dynamics
- Theoretical High Energy physics - Quantum Field Theory, Lattice gauge theory, Quantum Chromodynamics
- Solar Astrophysics
- Photonic Crystals, Metamaterials, and Terahertz Devices
- Soft matter and statistical physics
- Statistical Physics and Thermodynamics
- Lasers, Imaging through Disordered media, Photonic crystals, and optical waveguides
- Nonlinear optics and Fluorescence microscopy
- Microfluidics and Optofluidics
- Soft Matter
- Astrophysics, 21-cm Cosmology, Radio Astronomy, Cosmological Simulations

- Experimental Nuclear Physics
- Gravitational Wave Physics
- Gas Sensors, Chemical Sensors, Energy Storage Devices, Interface Electronics

P. INDIAN KNOWLEDGE SYSTEM

- Ethnography
- Indian Cultural Studies
- Human Ecology
- Indian History
- Indian Architecture and Planning System
- Ancient Indian Mathematics

Q. INFORMATION TECHNOLOGY RESEARCH AND AUTOMATION

- Interdisciplinary and Applied fields of computer science and engineering

R. CLEAN ENERGY AND CIRCULAR ECONOMY

- Net-zero energy buildings
- Hydrogen production and storage, and applications
- Geo-thermal based heating/cooling
- Carbon capture, utilization, and sequestration (CCUS)
- Waste management and recycling
- AI/ML based renewable energy predictive models
- Renewable energy technologies
- Circular economy assessment in any sector
- Energy storage systems
- Energy management, planning and policies
- Alternate fuels for engines
- Materials for sustainable building solutions and water purification
- Any other topics relevant with clean energy and circular economy

S. INDUSTRY INSTITUTIONAL RELATIONS

- Smart Manufacturing and Industry 4.0
- Artificial Intelligence and Industrial Automation
- Sustainable Engineering and Green Technologies
- Innovation and Technology Management
- Supply Chain Optimization and Industrial Analytics
- Environmental Impact and Circular Economy I Industry
- University Industry Linkages and Institutional Research

T. EXCELLENCE IN ARTIFICIAL INTELLIGENCE

- Interdisciplinary and Applied fields of Artificial Intelligence and Machine Learning where AI has a major role and which are of research interest to the CoE-AI faculty team.

Part II ADMISSION TO Ph.D. PROGRAMME

8. Introduction

Facility for doing research leading to Ph.D. degree is available in various Departments/Centre of NITC as detailed below:

	Department	Code
1	Architecture and Planning	AR
2	Bioscience and Engineering	BT
3	Chemical Engineering	CH
4	Chemistry	CY
5	Civil Engineering	CE
6	Computer Science and Engineering	CS
7	Education	ED
8	Electrical Engineering	EE
9	Electronics and Communication Engineering	EC
10	Humanities, Arts and Social Sciences	HS
11	Management Studies	MS
12	Materials Science and Engineering	MT
13	Mathematics	MA
14	Mechanical Engineering	ME
15	Physics	PH
	Centre	**Code**
16	Indian Knowledge System	IK
17	Information Technology Research and Automation	IT
18	Clean Energy and Circular Economy	CC
19	Industry Institutional Relations	IR
20	Excellence in Artificial Intelligence	AI

Applications are invited for admission to the Ph.D. programmes (Winter Semester) 2025 in the following schemes:

Scheme I: Full-time registration with Institute Fellowship or other Govt. Fellowships like CSIR-UGC JRF/KSCSTE/INSPIRE etc.

Scheme II: Full-time registration under the Self-Sponsored category

Scheme III: Full-time registration for candidates sponsored from Industry or other organizations including Educational Institutions

Scheme IV: Internal Registration for regular staff employed at NITC/ Research staff employed in funded projects at NITC

Scheme V: External (Part-time) Registration for candidates, from Industry or other organizations including Educational Institutions, who possess a post graduate degree

Scheme VI: External (Part-time) Registration to Direct PhD programme for candidates working in Industry/R&D Labs/Medical Institutions who do not have a post graduate degree but have relevant experience in reputed Industry/R&D Labs/Medical Institutions.

i. **Scheme I:** Prospective candidates can apply for **scheme I** mentioned above, under three categories: (i) The regular full-time scheme for candidates who possess post graduate degree in the appropriate branch/discipline of study as specified by the individual departments/Centre and (ii) The Direct Ph. D. scheme where B. Tech/ B.E./B. Arch/B. Plan./ B. Des./ B.S. (Four-year degree program) graduates with good academic records and research potential. It may be noted that the direct Ph.D. programme is offered by the Engineering departments/Department of Physics/ Department of Architecture & Planning/ other Centre of NITC. (iii) Integrated PhD: Conversion of M. Tech/M.Plan to PhD after the first year of study (Current NIT Calicut students only). Candidates selected under scheme I are eligible for institute fellowship.

ii. **Scheme II:** Candidates applying under **scheme II**, if selected for the Ph.D. programme, will be in the self-supporting mode. Such candidates will not receive any kind of fellowship/stipend from the institute. However, the students can try to get external funding after joining the Institute or/move to any internal funding scheme if available. They will also be able to join as Research staff of funded projects, if any, granted to the thesis guide/others subject to the approval of the Guide/funding agency and Competent authority at NIT Calicut.

iii. **Scheme III:** Prospective candidates applying for the Ph.D. programmes under **scheme III** shall be sponsored and financed by the sponsoring institute /organization/company. They are not entitled for Institute fellowship. The candidate must be a regular employee of a recognized Institution/Organization/Company with at least two years of continuous service. He/she should produce a sponsorship certificate form the Head of the Institution/Organization/Company along with the application. The employer should also indicate that the candidates will not be withdrawn midway till the completion of the course.

iv. **Scheme IV:** Candidates applying under **scheme IV** must be regular staff of NITC or research staff of funded projects employed at NITC. Such candidates have to attach a recommendation letter from the concerned HOD/Principal Investigator along with the application. The fellowship given to the research staff working in funded projects who joins the Ph.D. program will be as per the terms and conditions of the funded project. Such candidates can apply for Institute fellowship, if the Ph.D. programme is not completed within the duration of the project and it may be granted subject to the availability of fellowship at that point of time. They can also join as a research staff in a subsequent funded project in the institute with the consent of the thesis supervisor and subject to approval by Competent authority at NIT Calicut. If the research staff who has joined as a Ph.D. candidate under this scheme resigns his/her job before the completion of the funded project, his/her Ph.D. registration shall stand automatically cancelled. However, if he/she has completed the course work and comprehensive examination, he/she can be allowed to continue the research work as external registrant, if the Doctoral Committee of the research scholar recommends the same.

v. **Scheme V:** Candidates employed in Research and Development organizations/National

Laboratories/Industries/Academic Institutions can apply for Ph.D. admission under **scheme V** provided they have minimum of two years' experience at the time of application and **possess a post graduate degree in relevant discipline**. Such candidates have to submit a no objection-cum-Experience certificate, stating that the institute/organization/ company has no objection to the candidate joining for Ph.D. programme at NIT Calicut under the external (part-time) registration scheme, along with the application. Once admitted for the Ph.D. programme, there will not be mandatory residential requirements for such candidates. They are expected to complete the course work by opting for certified SWAYAM/MOOC/NPTEL courses or courses from similar platforms approved by the concerned Doctoral Committee. They can also credit courses offered by various departments/Centre at NITC. In such cases, attendance will not be made mandatory.

vi. **Scheme VI:** this scheme is specifically for External Registration to Direct PhD programme for candidates working in industry **who do not have a post graduate degree but have relevant experience in reputed Industry/R&D Labs/Medical Institutions**. The candidates applying for admission to Ph.D. Programmes under **Scheme VI** must have passed 4-year B.E./B.Tech./B.S./B.Plan./B.Des Degree or 5-year B. Arch./MBBS/BDS degree **with a minimum of 50% marks (CGPA 5.0/10)** in the qualifying examination. Candidates who secured B. Tech./B.E/B.Arch./B. Plan./B.Des. degree under lateral entry should also have passed the three-year diploma in engineering with a minimum of 50% marks. Holders of AMIE/other nationally approved programmes equivalent to B. Tech./B.E. in an appropriate area of study may also be considered eligible. **It is desirable for the applicants to have patents or research publications in reputed conferences/journals. This may be considered as a desirable eligibility condition for the candidates seeking admission under this category**. Selection of candidates for the PhD programme under Scheme VI shall be based on their performance in written test and/or interview conducted by the concerned Department/Centre. The applicant must be an employee of the Industry/ R&D organization/ Medical Institution *with two years of total experience* and be engaged in professional work in the broad area to which Ph.D. admission is sought. A *No objection-cum-experience certificate* (in the format specified by NIT Calicut) issued by the competent authority of the present company/organization/Medical Institution shall be attached along with the application. Such candidates will pursue the PhD programme along with their job. Candidates admitted to this program are required to complete the requirements such as Semester registration, Course work, DC meetings, Comprehensive examination, Open seminar, Synopsis submission and Thesis submission as per the relevant rules applicable for candidates admitted in Scheme-V. Course work requirements shall be the same as that specified for Direct PhD candidates under Scheme-I. Candidates working in Engineering/Science colleges or other similar institutions are not eligible to apply under this scheme.

9. Department-wise Seat Matrix for Scheme I (Full-time registration with Institute Fellowship)

Sl. No.	Department	Open	Open PwD*	OBC-NCL	OBC-NCL PwD*	SC	SC PwD*	ST	EWS	EWS PwD*
1	Architecture and Planning	2	0	1	0	16	1	11	13	1
2	Bioscience and Engineering	0	0	0	0					
3	Chemical Engineering	0	0	1	1					
4	Chemistry	0	0	0	0					
5	Civil Engineering	0	0	2	0					
6	Computer Science & Engineering	7	0	0	1					
7	Education	1	0	0	0					
8	Electrical Engineering	2	1	0	0					
9	Electronics & Communication Engineering	5	1	1	0					
10	Humanities, Arts & Social Sciences	0	0	1	0					
11	Management Studies	0	0	1	0					
12	Material Science & Engineering	0	0	0	0					
13	Mathematics	2	0	1	0					
14	Mechanical Engineering	4	0	0	0					
15	Physics	0	1	0	0					
Total		**22**	**3**	**8**	**2**	**16**	**1**	**11**	**13**	**1**

Note :

* If no candidates are available under the PwD category, the PwD seats will be converted to the base category.

10. Reservation Policy

Government of India reservation policy will be followed for GEN-EWS/OBC-NCL/SC/ST and the Persons with Disabilities (PwD) categories for admissions to Ph.D. programme under **Scheme-I**. In the absence of application from PwD candidates, the seat reserved for PwD category will be filled by the candidate(s) who belong to the same category (without PwD). De-reservation will not applicable for any other categories.

11. Minimum Qualifications, Eligibility Requirements & Selection Process for Admission to Ph.D. Programmes

This section details: (i) the minimum qualifications and other academic eligibility requirements, (ii) the selection process and (iii) PG/UG degree requirements for admission to PhD programme offered by various Departments/Centre of NIT Calicut.

A. Minimum qualifications and other academic eligibility requirements for PhD admissions in various Departments

Scheme I (Full time with Institute Fellowship or other Govt. Fellowships like CSIR-UGC JRF/KSCSTE/INSPIRE etc.

Qualifying Degree of the Prospective Candidates	Minimum CGPA requirement for General/ OBC/ EWS Candidates	Minimum CGPA requirement for SC/ ST/ PWD Candidates	Additional Mandatory Requirements++
M. Tech./ M. E./ M.Arch/M.Plan/M.S./ M.S. (by research) or equivalent post graduate degrees in Engineering/ Technology/ Architecture/ Planning $$	6.0 CGPA or 60% marks	5.5 CGPA or 55% marks	(a) Qualified UGC-NET **OR** (b) Secured Govt. Fellowships such as DST-INSPIRE/CSIR-UGC JRF/KSCSTE/NBHM/DBT etc. (tenable from the current year) **OR** (c) Selected through a National level PhD entrance examination conducted by NIT Calicut. Exam will be conducted at NIT Calicut.
M. Sc./ M. Com./ MBA**/MA/ M.Ed./ MCA or equivalent post-graduate degree$$ in Science, Commerce, Arts, Management etc. with VALID GATE Score (as applicable), or with Valid UGC CSIR- NET, (VALID JEST only for Physics).	6.0 CGPA or 60% marks	5.5 CGPA or 55% marks	(a) Qualified UGC-NET **OR** (b) Secured Govt. Fellowships such as DST-INSPIRE/CSIR-UGC JRF/KSCSTE/NBHM/DBT etc. (tenable from the current year) **OR** (c) Selected through a National level PhD entrance examination conducted by NIT Calicut. Exam will be conducted at NIT Calicut.
Master's degree in Medicine/Surgery/ Veterinary Medicine/Agriculture/ Pharmacy$$	6.0 CGPA or 60% marks	5.5 CGPA or 55% marks	(a) Secured Govt. Fellowships such as DST-INSPIRE/CSIR-UGC JRF/KSCSTE/NBHM/DBT etc. (tenable from the current year) **OR** (b) Selected through a National level PhD entrance examination conducted by NIT Calicut. Exam will be conducted at NIT Calicut.
B. Tech/ B.E./ B. Arch/B.Des./ B. S. or equivalent degree (For, Integrated PhD: Conversion of M. Tech/M.Plan to PhD after the first year of study (Applicable to current students of M.Tech/M.Plan at NIT Calicut)	7.5 CGPA or 75% marks	7.0 CGPA or 70% marks	Selected through a National level PhD entrance examination conducted by NIT Calicut. Exam will be conducted at NIT Calicut.
B. Tech/ B.E./ B. Arch/B.Des./ B. S. or equivalent degree with **VALID** NET/GATE Score	7.5 CGPA or 75% marks	7.0 CGPA or 70% marks	(a) Secured Govt. Fellowships such as DST-INSPIRE /CSIR-UGC JRF/KSCSTE/NBHM/DBT etc. (tenable from the current year) **OR** (b) Selected through a National level PhD entrance examination conducted by NIT Calicut. Exam will be conducted at NIT Calicut.

++Final selection of the candidates is subject to them clearing the selection process conducted by the concerned Departments/Centre

$$Apart from this, the candidates should possess minimum 60% marks (CGPA 6.0/10) or equivalent in their Bachelor's degree as well [For SC/ST/PWD candidates, the minimum requirement is 55% mark (CGPA 5.5/10)]. Candidates who secured B. Arch/ B. Plan./ B. Tech. degree under lateral entry should have passed the three-year diploma in engineering with minimum 60% marks (CGPA 6.0/10) [For SC/ST/PWD candidates 55% marks (CGPA 5.5/10)]. Holders of AMIE (approved by AICTE) / other nationally approved programmes equivalent to B.Tech./B.Arch. / B. Plan. will also be considered eligible. ** NET/GATE Score not mandatory for admission to PhD in Management Studies.

Scheme II (Full-time Self-sponsored)

Qualifying Degree of the Prospective Candidates	Minimum CGPA requirement for General/ OBC/ EWS Candidates	Minimum CGPA requirement for SC/ ST/ PWD Candidates	Additional Mandatory Requirements[++]
M. Tech./ M. E./ M. Arch/M. Plan/ M. S./ M. S. (by research) or equivalent post graduate degrees in Engineering/Technology/ Architecture/Planning[$$]	6.0 CGPA or 60% marks	5.5 CGPA or 55% marks	Candidates will be selected through a National level PhD entrance examination conducted by NIT Calicut. Exam will be conducted at NIT Calicut.
M. Sc./ M. Com./ MBA/ MA/M.Ed./MCA or equivalent post-graduate degree in Science, Commerce, Arts, Management etc.$$ **	6.0 CGPA or 60% marks	5.5 CGPA or 55% marks	
Master's degree in Medicine/Surgery/ Veterinary Medicine/Agriculture/ Pharmacy[$$]	6.0 CGPA or 60% marks	5.5 CGPA or 55% marks	

[++]Final selection of the candidates is subject to them clearing the selection process conducted by the concerned Departments

[$$]Apart from this, the candidates should possess minimum 60% marks (CGPA 6.0/10) or equivalent in their Bachelor's degree as well [For SC/ST/PWD candidates, the minimum requirement is 55% mark (CGPA 5.5/10)]. Candidates who secured B. Arch/ B. Plan./ B. Tech. degree under lateral entry should have passed the three-year diploma in engineering with minimum 60% marks (CGPA 6.0/10) [For SC/ST/PWD candidates 55% marks (CGPA 5.5/10)]. Holders of AMIE (approved by AICTE) / other nationally approved programmes equivalent to B.Tech./B.Arch. / B. Plan. will also be considered eligible.

** NET/GATE Score not mandatory for admission to PhD in Management Studies.

Scheme III and Scheme IV (Full-time Industry Sponsored/Internal candidates)

Qualifying Degree of the Prospective Candidates	Minimum CGPA requirement for General/ OBC/ EWS Candidates	Minimum CGPA requirement for SC/ ST/ PWD Candidates	Additional Mandatory Requirements
M. Tech./ M. E./ M. Arch/M. Plan/ M. S./ M. S. (by research) or equivalent post graduate degrees in Engineering/Technology/ Architecture/Planning	6.0 CGPA or 60% marks	5.5 CGPA or 55% marks	Candidates will be selected through written test and/or interview conducted by the concerned Department/Centre
M. Sc./ M. Com./ MBA/ MA/ M.Ed./ MCA or equivalent post-graduate degree in Science, Commerce, Arts, management etc.	6.0 CGPA or 60% marks	5.5 CGPA or 55% marks	
Master's degree in Medicine/Surgery/ Veterinary Medicine /Agriculture/Pharmacy	6.0 CGPA or 60% marks	5.5 CGPA or 55% marks	

Scheme V [External (part-time) after PG]

Qualifying Degree of the Prospective Candidates	Minimum CGPA requirement	Additional Mandatory Requirements
M. Tech./ M. E./ M. Arch/M. Plan/ M.S./M. S. (by research) or equivalent post graduate degrees in Engineering/Technology/ Architecture/Planning.	5.0 CGPA or 50% marks	Candidates should have a total of two years' experience. Candidates will be selected through written test and/or interview conducted by the concerned Department/Centre
M.Sc./M.Com./MBA/MA/M.Ed./MCA or equivalent post-graduate degree in Science, Commerce, Arts, Management etc.	5.0 CGPA or 50% marks	
Master's degree in Medicine/Surgery/ Veterinary Medicine/Agriculture/Pharmacy	5.0 CGPA or 50% marks	

Scheme VI [External (part-time) after UG]

Qualifying Degree of the Prospective Candidates	Minimum CGPA requirement	Additional Mandatory Requirements
B.E./B.Tech./B.S./B.Plan./B. Arch./B.Des./MBBS/BDS or equivalent	5.0 CGPA or 50% marks	Candidates should have a total of two years' experience. Candidates will be selected through written test and/or interview conducted by the concerned Department /Centre

B. Selection Process for Admission to Ph.D. Programmes

- **For selection to PhD Scheme-I with Institute Fellowship and Scheme-II (Self-sponsored), the candidates must qualify the National level PhD entrance examination & Interview conducted by NIT Calicut for admissions to the Ph.D. programme. Exam will be conducted at NIT Calicut**

- **The number of PhD seats under Scheme-I with Institute Fellowship in each Department are limited. Hence allocation of PhD seats under Scheme-I with Institute Fellowship will be based on the rank list prepared by Department. Once the Institute fellowships are exhausted, the remaining candidates in the rank list will be considered for PhD admission under Scheme-II (Self-sponsored), provided they have indicated their preference for Scheme-II (Self-sponsored) during the application process / Interview.**

- **Those candidates, who have secured Govt. fellowships such as CSIR-UGC JRF/KSCSTE etc., will be selected for PhD admission based on their performance in written test and/or interview conducted by respective Departments/Centre of NIT Calicut. Fellowship for such candidates shall be as per the norms of the funding agency.**

- **The selection of candidates for the PhD programme under Schemes III-VI will be based on written test and/or interview conducted by the respective Departments/Centre.**

C. Masters/Bachelor's Degree Requirements for Admission to Ph.D. Programmes in Various Departments/Centre (Schemes I-V)

a. Department of Architecture and Planning

Master's degree in Architecture/Design/Planning/Engineering/Technology/Civil Engineering (Structural Engineering, Building Technology, Construction Technology) or in any other relevant disciplines (such as in Geography, Sociology, Economics, Disaster management etc.) related to major areas of research available in the Department.

b. Department of Bioscience Engineering

A Master's degree in Engineering/Technology/Pharmacy

OR

Master's degree in any discipline in Science

OR

Master's degree in Medicine/Surgery with a Bachelor's degree in MBBS/BDS/Bachelor of Ayurvedic Medicine and Surgery/Bachelor of Siddha Medicine and Surgery/ Bachelor of Homeopathic Medicine and Surgery/ Bachelor of Naturopathy & Yoga/ Bachelor of Unani Medicine & Surgery

OR

Master's degree in Veterinary Medicine/Agriculture/Forestry.

c. Department of Chemical Engineering

For admissions to PhD programme in Department of Chemical engineering, the candidates must possess ME/M. Tech./M. Tech (by research)/MS/MS (by research) / Integrated / dual degree M. Tech. in Chemical Engineering/ or any other relevant branch of Engineering and Technology including Petroleum/ Petrochemical/Energy/ Environmental Technology /Biotechnology/Industrial Biotechnology/Biochemical/ Polymer science &Technology/Ceramic/Nanotechnology/Material science/ Thermal Engineering /Metallurgy/ Applied Electronics / Instrumentation and Control. M.Sc. degree in Chemistry/Physics/Maths/ any other relevant disciplines related to major areas of research in Chemical Engineering.

d. Department of Chemistry

Master's degree in Chemistry/any other relevant disciplines related to major areas of research In the department of chemistry.

e. Department of Civil Engineering

The candidates applying for admissions to Ph.D. Programmes in Civil Engineering Department at NITC must meet the following minimum eligibility requirements:

M.E/M.Tech. Degree in Civil Engineering or allied discipline.

OR

M.Sc/M.S. or equivalent degree in Geology/ Geoinformatics.

f. Department of Computer Science and Engineering

The candidates applying for admission to Ph.D. Programmes under Schemes I-VI in the Computer Science and Engineering Department must meet the following minimum eligibility requirements:

M.E./M.Tech./M.S. Degree with any one of the degrees (Undergraduate or Postgraduate) in Computer Science and Engineering / Information Technology / Electrical and Electronics Engineering / Electronics and Communication Engineering or other equivalent Engineering disciplines.

OR

MSc./MS or equivalent degree in Mathematics/Statistics/Computer Science/Electronics/Physics/Bioinformatics or MCA degree

g. Department of Education

Candidates seeking registration to the doctoral programme shall have passed the Master's Degree in Education, from a University recognized by the University Grants Commission. Candidates who have secured Bachelor's or Master's degree in education in distance education mode are not eligible.

h. Department of Electrical Engineering (EED)

For admission to Ph. D programme in EED, candidates with ME/M. Tech. or equivalent in Electrical Engineering (EE)/Electrical & Electronics Engineering (EEE)/ Electronics & Communication Engineering (ECE)/Applied Electronics & Instrumentation (AEI)/Electronics & Instrumentation (EI)/Instrumentation & Control (IC) /Avionics (AVN)/ Biomedical Engineering/Energy sciences/ Energy Engineering/ Electric Vehicle Engineering or in relevant disciplines related to major areas of research available in EE Department.

OR

Passed MSc. or equivalent degree in in appropriate and relevant disciplines related to major areas of research available in Electrical Engineering Department.

i. Department of Electronics and Communication Engineering (ECE)

Passed M.E./M.Tech./M.S. Degree in Electronics and Communication Engineering (ECE)/Electrical Engineering (EE)/Computer Science and Engineering (CSE) or in relevant disciplines related to major areas of research available in ECE Department. Candidates are also required to have passed BE/B. Tech./BS in ECE/EE/CSE or allied discipline.

OR

Passed MSc. or equivalent degree in Electronics/Computer Science/Data Science/Physics/Material Science/Mathematics/Statistics.

j. Department of Humanities Arts and Social Science

i) For PhD programme in English: Candidates should possess minimum 60% marks (CPGA 6.0/10) or equivalent both in Bachelor's and Master's degrees in English language and literature/English language teaching/cultural studies/comparative literature/other domains of English language and literature studies from an Institution recognized by UGC/AICTE. For SC/ST/PWD candidates, the minimum requirement is 55% marks (CGPA 5.5/10) or equivalent both in Bachelor's and Master's degree with a valid GATE/UGC NET score relevant to the academic degree.
ii) For PhD programme in Economics: Candidates should possess minimum 60% marks (CPGA 6.0/10) or equivalent both in Bachelor's degree (any discipline) and Master's degree in Economics from an Institution recognized by UGC/AICTE. For SC/ST/PWD candidates, the minimum requirement is 55% marks (CGPA 5.5/10) or equivalent both in Bachelor's and Master's degree with a valid GATE/UGC NET score relevant to the academic degree.

k.. Department of Management Studies

Candidates should possess minimum 60% marks (CGPA 6.0/10) or equivalent in both relevant Bachelor's degree and Master's degrees in Business Administration/Finance (M.Com) from an Institution recognized by UGC/AICTE. For SC/ST/PWD candidates, the minimum requirement is 55% marks (CGPA 5.5/10) or equivalent both in Bachelor's and Master's degree Candidates shall be required to have passed both the bachelor and two-year Master's degree in regular full-time or part-time mode. Candidates who have secured Bachelors or Master's degree in distance education mode are not eligible.

l. Department of Materials Science and Engineering

M.E./M. Tech./MS Degree in the appropriate branch of study related to major areas of research available in Materials Science and Engineering

OR

M.Sc. degree in Chemistry/Physics/Life science/Nanoscience and Technology/ any other relevant disciplines related to major areas of research in Materials Science and Engineering

OR

Master's degree in Medicine/Surgery/Pharmacy with a Bachelor's degree in MBBS/BDS/Bachelor of Ayurvedic Medicine and Surgery/Bachelor of Siddha Medicine and Surgery/ Bachelor of Homeopathic Medicine and Surgery/ Bachelor of Naturopathy & Yoga/ Bachelor of Unani Medicine & Surgery/Pharmacy.

OR

Master's degree in Veterinary Medicine/Agriculture.

m. Department of Mechanical Engineering (ME)

Candidates with ME/M.Tech. or equivalent Master's degree in Mechanical Engineering, Aerospace Engineering, Automobile Engineering, Automotive Engine Tech., Biomedical Engineering, Chemical Engineering, Computer Science, Electrical Engineering, Electronics Engineering, Energy Engineering, Industrial Engineering, Instrumentation, Maintenance Management, Metallurgical Engineering, Materials Science, Production/ Manufacturing Engineering/Agricultural Engineering or in relevant disciplines related to the major areas of research available in Mechanical Engineering Department. Candidates are also required to have passed BE/B. Tech./BS in relevant discipline.

n. Department of Physics/Mathematics

Master's degree in an appropriate subject of Mathematics/Statistics/Physics/Life Sciences/ Electronics/Computer Science and Applications/ Nano Science and Technology/ Material Science/ Photonics.

OR

M.E./M. Tech. Degree in the appropriate branch of study in relevant disciplines related to the major areas of research available in these Departments.

o. Centre for Indian Knowledge System

Any post graduate Masters degree from recognized Universities in India or abroad after completion of a three-year or four-year bachelor's degree program.
Institute fellowships are not available for Ph.D. aspirants in the Centre for Indian Knowledge Systems. Prospective candidates possessing UGC-JRF/CSIR Fellowships shall apply under scheme 1 (other government fellowships). Prospective candidates are permitted to apply under other schemes II to VI as well.

p. Centre for Information Technology Research and Automation

Any post graduate Masters degree from recognized Universities in India or abroad after completion of a three year or four year bachelor's degree program.
Institute fellowships are not available for PhD aspirants in the Centre for Information Technology Research and Automation, prospective candidates possessing UGC-JRF/CSIR shall apply under scheme 1 (other government fellowships). Prospective candidates are permitted to apply under other scheme II-VI as well.

q. Centre for Clean Energy and Circular Economy

Prospective candidates need to have Bachelor's and Master's degrees in Science/Engineering/Technology/Management/Architecture/Arts from recognized universities in India or abroad.
Institute fellowships are not available for PhD aspirants in the Centre for Clean Energy and Circular Economy, prospective candidates possessing UGC-JRF/CSIR shall apply under scheme 1 (other government fellowships). Prospective candidates are permitted to apply under other scheme II-VI as well.

r. Centre for Industry Institutional Relations (CIIR)

Prospective candidates need to have Bachelor's and Master's degrees in Science/Engineering/Technology/Management/Architecture/Arts from recognized universities in India or abroad.
Institute fellowships are not available for PhD aspirants in the Centre for Industry Institutional Relations, prospective candidates possessing UGC-JRF/CSIR shall apply under scheme 1 (other government fellowships). Prospective candidates are permitted to apply under other scheme II-VI as well.

s. Centre of Excellence in Artificial Intelligence (CoE-AI)

Any Post Graduate Master's degree from recognized Universities in India or abroad after completion of a three or four years Bachelor's Degree Program.
Institute fellowships are not available for PhD aspirants in the Centre of Excellence in Artificial Intelligence, prospective candidates possessing UGC-JRF/CSIR shall apply under scheme 1 (other government fellowships). Prospective candidates are permitted to apply under other scheme II-VI as well.

12. Eligibility Requirements for Direct Ph.D. Programmes and Qualifying Degrees Obtained from Foreign Universities

a. Direct Ph.D. Programme (Full-time) under Scheme I

Candidates with B.E./ B. Tech./ B. Arch./ B. Plan./ B. Des./B.S. (Four-year degree program) or equivalent with 7.5 CGPA on a 10-point scale or 75% Marks [For SC/ST/PWD candidates, 7.0 CGPA on a 10-point scale or 70% Marks] are eligible to apply for direct Ph. D admission within 5 years after obtaining the qualifying degree. Direct Ph.D. programme is offered by all Departments / Centre of NIT Calicut.

b. Direct PhD programme (External -Part-time) under Scheme VI

Scheme VI is specifically for External (part-time) Registration to Direct PhD programme for candidates working in industry who do not have a post graduate degree but have relevant experience in reputed Industry/R&D Labs/Medical Institutions. The candidates applying for admission to Ph.D. Programmes under **Scheme VI** must have passed B.E./B.Tech./B.S./B.Plan./MBBS/BDS degree **with a minimum of 50% marks (CGPA 5.0/10)** in the qualifying examination. **It is desirable for the applicants to have patents or research publications in reputed conferences/journals. This may be considered as a desirable eligibility condition for the candidates seeking admission under this category**.

c. Candidates Holding Degrees from Foreign Universities

If the candidates applying for Ph.D. admission at NITC have secured their undergraduate/post graduate degrees from foreign universities, they have to produce a certificate stating that the degrees of the candidates have been recognized and approved by the Association of Indian Universities (AIU)/ Commonwealth Universities/International Association of Universities (IAU)/Accredited Universities as equivalent to the corresponding Indian degrees for the purpose of higher studies. However, if the candidates have secured their undergraduate/post graduate degrees from reputed foreign institutions (i.e., institutions within QS rank ≤500), their applications will be considered by an expert committee constituted in this regard.

13. How to Apply?

a. Apply online using the following link:

b. https://research.nitc.ac.in/login (The link will be active on October 11th, 2025, at 1:00 PM)

c. Register with your e-mail id for creating a login in the online portal.

d. Before login, keep the soft copy of the following documents ready with you for uploading in the portal.

i. Degree certificates and consolidated mark list (If consolidated mark list is not available semester wise/ year wise mark lists combined in a single pdf file) (Maximum of 800 kB).
OR
A certificate from the Head of the Institution stating that he/she has

appeared/appearing for the final semester examination (for candidates who are appearing for their final examination and are awaiting results)

ii. Recent Photograph (Maximum of 50 kB)
iii. Candidate's Signature (Maximum 40 kb)
iv. Aadhaar Card
v. First page of the research publications in Journals and Conferences
vi. For candidates belonging to SC/ST category, Valid Community Certificate from a competent authority (not below the rank of Tahsildar).
vii. Certificate from the Medical Board of Govt. Medical Colleges/Dist. Head Quarters Hospitals, in the case of Physically Handicapped candidates.
viii. Proof of NET/GATE score or Fellowships (UGC/ CSIR/NBHM/JEST/KSCSTE etc.)
ix. **Candidates under OBC-NCL category applying for Institute Fellowships (Scheme I) have to upload the recent OBC-NCL certificate issued by a competent authority (not below the rank of Tahsildar) indicating the status regarding Creamy Layer based on financial year ending March 31, 2025 (i.e., the certificate should have been issued on or after 1st April, 2025).**
x. **Candidates under OPEN-EWS category applying for Institute Fellowships have to upload the recent EWS certificate issued from a competent authority (not below the rank of Tahsildar) based on financial year ending March 31, 2025 (i.e., the certificate should have been issued on or after 1st April, 2025).**
xi. **If a candidate fails to upload the relevant category certificate as mentioned above, his/her claim for reservation will be cancelled. Thereafter, such candidates will be considered under OPEN category only.**
xii. For candidates applying under scheme III, a *Sponsorship Certificate*, signed by the Head/Competentauthority of the Institution/organization/Company has to be uploaded in the prescribed format.
xiii. For candidates applying under scheme IV, a No Objection Certificate from the Head of the department/centre has to be uploaded.
xiv. For candidates applying under schemes V & VI, a *No Objection-cum- Experience Certificate* signed by the Head/Competent authority of the Institution/organization/Company has to be uploaded, along with the application.

- **The formats of all required certificates are available at**: https://nitc.ac.in/pg-formats-of-certificates.

- **One candidate can apply to maximum of two departments with single application fee, if the same candidate wants to apply for the third department the candidate needs to pay the application fee again and submit separate application.**

14. Fee to be paid at the time of admission

Category: Full Time

1. **Institute Fellowship**
2. **Govt Fellowships– JRF/UGC/NET/CSIR/KSCSTE, Internal Registrants -Regular Employees of NITC/Research Staff in funded projects of NITC, QIP etc.**

Sl. No	Fee Category	Winter Semester Admission
1	Tuition Fee #	7,500
Other Fees		
1	Registration Fee	2,000
2	Examination Fee	2,000
3	Students Activities Fee	600
4	Association and Cultural Fee	1,200
5	Students Welfare Fee	1,200
6	Career Development Fee	1,200
7	Library Fee	6,000
8	Central Computing Facility Fee	600
9	Internet Fee	1,200
10	Sports Fee	1,200
11	Health Centre Facility Fee	1,200
12	Annual Premium for Medical Insurance	1,500
13	Campus Amenities Fee	1,200
	Total of Other Fees	**21,100**
Thesis Evaluation Fee *		25,000/-
One Time Fees		
1	Caution Deposit	20,000
2	Admission Fee	5,000
3	Campus Development Fee	25,000
4	Alumni Affairs Fee	5,000
5	Convocation Fee	5,000
6	Identity Card & Miscellaneous Fees	1,000
	Total of One Time Fees	**61,000**
	Total	**89,600**

Tuition fee is exempted for SC/ST students
* To be paid during the registration for 5th Semester

- Categories, tuition fee and exemptions fixed by the Government of India are subject to change from time to time.
- Amount towards Annual Premium for Medical Insurance may vary every year.
- No tuition fee exemption for QIP and internal registrants.
- Students availing hostel need to pay Rs. 12,000/- extra against Hostel Seat Rent per semester

Category: Full Time Self Sponsored, Other Sponsored (Industry /Organization/ Educational Institution) & External

Sl. No	Fee Category	Winter Semester Admission
1	Tuition Fee	35,000
Other Fees		
1	Registration Fee	2,000
2	Examination Fee	2,000
3	Students Activities Fee	600
4	Association and Cultural Fee	1,200
5	Students Welfare Fee	1,200
6	Career Development Fee	1,200
7	Library Fee	6,000
8	Central Computing Facility Fee	600
9	Internet Fee	1,200
10	Sports Fee	1,200
11	Health Centre Facility Fee	1,200
12	Annual Premium for Medical Insurance	1,500
13	Campus Amenities Fee	1,200
	Total of Other Fees	**21,100**
Thesis Evaluation Fee *		25,000/-
One Time Fees		
1	Caution Deposit	20,000
2	Admission Fee	5,000
3	Campus Development Fee	25,000
4	Alumni Affairs Fee	5,000
5	Convocation Fee	5,000
6	Identity Card & Miscellaneous Fees	1,000
	Total of One Time Fees	**61,000**
	Total	**1,17,100**

* To be paid during the registration for Vth Semester

- Categories, tuition fee and exemptions fixed by the Government of India are subject to change from time to time.
- Amount towards Annual Premium for Medical Insurance may vary every year.
- Students availing hostel need to pay Rs. 12,000/- extra against Hostel Seat Rent per semester

Note: The fee refund policy is available on the NIT Calicut website. Kindly review it carefully before submitting your application.

15. Important Dates

Events	Dates
Activation of the website for submission of Online application	**11 October 2025 (01:00PM)**
Last date for submission of completed application form through on-line	**27 October 2025 (10:00AM)**
Publishing the list of short-listed candidates for the selection process, in the website	**07 November 2025 (Tentative)**
Selection process for short listed candidates (Offline Mode)	**25 -28 November 2025 (Tentative)**
Date of Admission and Reporting for the Programme	**18 December 2025 (Tentative)**

LEGAL JURISDICTION

All disputes pertaining to the counselling and admission for the Ph.D. programme of NIT Calicut shall fall within the jurisdiction of High Court of Kerala only.

DISCLAIMER

The statement made in the information brochure and all other information contained herein is believed to be correct at the time of publication. However, the Institute reserves the right to make at any time without notice, changes in and additions to the regulations, conditions governing the admission, requirements, seats, fees and any other information, or statements contained in this information brochure. No responsibility will be accepted by the Institute/Chairperson- PG Admissions for hardship or expenses encountered by its students/any other person for such changes, additions, omissions or errors, no matter how they are caused.

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