INFORMATION BROCHURE

For Admission to

Ph.D. Programme: Full-Time (with Scholarship)/ Part-Time/Self-Financed/Sponsored (AY: 2024-25) June Session

NATIONAL INSTITUTE OF TECHNOLOGY GOA
Cuncolim, South Goa, GOA – 403703
www.nitgoa.ac.in

1. Important Information

Applications are invited for the admission to Ph.D. programmes (Full-Time(with scholarship)/Part-Time/Self-Financed/Sponsored) for the academic year (AY: 2024-25) June Session at the following Departments of NIT Goa:

- Department of Computer Science and Engineering (CSE)
- Department of Electrical and Electronics Engineering (EEE)
- Department of Electronics and Communications Engineering (ECE)
- Department of Civil Engineering (CVE)
- Department of Mechanical Engineering (MCE)
- Department of Applied Sciences (APS)
- Department of Humanities and Social Sciences (HSS)

Applicants must apply through online portal http://mis.nitgoa.ac.in/PhDApplication/ only.

A student applying for more than one Department will have to fill separate application forms.

Applicants are advised to read this Information Brochure carefully and Check the Reservation Chart (only for Full-Time with scholarship) in page 7 before applying online.

Admission to Ph.D. programmes will be in the following schemes:

- **Full-Time (with scholarship):**
  The candidates selected under this scheme shall be entitled for scholarship/assistantship and House Rent Allowance (HRA) as per Govt. of India norms from time to time. Please read the scholarship requirement section for detailed information.

- **Part-Time**
  Part-time Ph. D programme is offered for working professionals from Govt. R&D Organizations /Public Sector /Industries /National Research Laboratories and for faculty members from Govt./Govt. Aided /Private Engineering/Science and Arts Colleges/Universities. It is necessary for a candidate applying under part-time scheme to produce a "No Objection Certificate" on a proper letter head from the appropriate authority in the organization where he is presently employed. Students admitted under part-time scheme have to serve a minimum one semester residential period at the Institute.

- **Self-Financed**
  - **This is a full-time Ph. D program without scholarship.**
  - **Under this scheme, the candidate has to be physically present in the campus.**
  - **The candidate must fulfill all other full-time Ph.D. program requirements.**

- **Sponsored:**
  - **This is a full-time Ph. D program without scholarship.**

- **The Institute may admit persons who are employed in a Central/State Govt. Departments/PSUs/Reputed Educational Institutes/Research organizations/ Reputed Industries for doing research in the Institute on a full-time basis.**
- **Candidates may be sponsored by a company or by educational institute or Industry or an Organization or Department etc.**
- **Under this scheme, the candidate has to be physically present in the campus.**
- **The candidate must fulfill all other full-time Ph.D. program requirements.**

2. Eligibility and Academic Requirements

➢ **For Ph. D in Engineering and Technology (CSE, ECE, EEE, CVE, MCE):** Master's Degree in Engineering or Technology (M.E. or M.Tech.) in the relevant discipline with a minimum 6.5 CGPA on a 10 point scale grading system or 60% marks in both Bachelor's and Master's levels from recognized Technical Institute or University. For SC/ST candidates a minimum 6.0 CGPA on a 10 point scale grading system or 55% marks.

Exceptional candidates (with CGPA >= 9.0) with B.Tech./B.E from a reputed Institute are also eligible to apply for the Ph.D. programme.

➢ **For Ph. D in Applied Sciences:** Master's degree in Sciences / M. Tech. in the relevant area with a minimum 6.5 CGPA on a 10 point scale grading system or 60% marks in both Bachelor's and Master's levels from recognized Institute or University. For SC/ST candidates a minimum 6.0 CGPA on a 10 point scale grading system or 55% marks.

➢ **For Ph. D in Humanities & Social Sciences:** Master's degree in Humanities/Social Sciences with a minimum 6.0 CGPA on a 10 point scale grading system or 55% marks in both Bachelor's and Master's levels from recognized Institute or University. For SC/ST candidates a minimum 5.5 CGPA on a 10 point scale grading system or 50% marks.

3. Indicative list of Broad Areas of Research

❖ **Computer Science and Engineering (CSE)**

➢ **Full-time (with scholarship):** Brain-Computer Interface, Machine Learning, Computer Vision, Internet of Things, Cyber Physical Systems, Natural Language Processing, AI for Agriculture, Applied Machine Learning to Audio, Speech, Text, Images , Keyword spotting in speech/audio, speech understanding, audio/speech retrieval, Data Mining, Machine Learning , Social Media Mining., Internet of Things, Optimization Algorithms, Wireless Sensor Networks, Edge Computing, High Performance Computing. Quantum ML, Quantum communication, AI/ML for communication systems: Federated learning, Mobile Edge Computing, Industrial IoT (IIoT) and Cloud computing, Advanced Mobile Communication (5G/6G), Game theory application in advanced computer network, AI, Deep Learning and Soft Computing, Blockchain, Cryptography, Security and Privacy, Industrial IoT, AI/ML Applications in Security.

➢ **Part-Time/Self-Financed/Sponsored:** Brain-Computer Interface, Machine Learning, Computer Vision, Internet of Things, Cyber Physical Systems, Natural Language Processing, AI for Agriculture, Applied Machine Learning to Audio,

Speech, Text, Images , Keyword spotting in speech/audio, speech understanding, audio/speech retrieval, Data Mining, Machine Learning , Social Media Mining., Internet of Things, Optimization Algorithms, Wireless Sensor Networks, Edge Computing, High Performance Computing. Quantum ML, Quantum communication, AI/ML for communication systems: Federated learning, Mobile Edge Computing, Industrial IoT (IIoT) and Cloud computing, Advanced Mobile Communication (5G/6G), Game theory application in advanced computer network, AI, Deep Learning and Soft Computing, Blockchain, Cryptography, Security and Privacy, Industrial IoT, AI/ML Applications in Security.

❖ Electrical & Electronics Engineering (EEE)

- ➢ **Full-time (with scholarship):** Power Electronics and drives, Renewable Energy Systems, Power Systems, Smart Grids, Electric Vehicles, Control System, Digital Signal / Image Processing, FPGA Accelerators, Wavelets, Artificial Intelligence
- ➢ **Part-Time/Self-Financed/Sponsored:** Power Electronics and drives, Renewable Energy Systems, Power Systems, Smart Grids, Electric Vehicles, Control System, Digital Signal / Image Processing, FPGA Accelerators, Wavelets, Artificial Intelligence

❖ Electronics & Communication Engineering (ECE)

- ➢ **Full-time (with scholarship):** Infrared Thermography, Nanodevices, Applied Instrumentation, Agriculture Electronics, Microwave imaging, inverse problems, ground penetrating radar, AI in medicine, AI and ML for sensors at nanoscale, nanoscale optical sensors, Low Cost Point of Care Diagnostics, RF and Microwave Engineering, Antennas, Passive microwave Circuits, AI and Microwaves, Microelectronics, VLSI Design, Analog and Mixed Signal Design, AI assisted VLSI circuits, Microelectronics, Digital and Analog VLSI, FPGA based digital design implementation, Network on CHIP. Low power Active filter circuit Design, Signal processing for wireless communication, Machine learning for 6G and beyond, Standard, Image Denoising, Biomedical image Analysis, Image Classification, Object Tracking, Ultrasound signal analysis, FPGA Based Image Processing Applications, Machine Learning, Semiconductor Devices (BiCMOS, BJTs, MOSFETs, TFETs etc.), VLSI CIrcuit Designs, VHDL, VERILOG, System Verilog, FPGA & ASIC, Microstrip Antenna Design; dielectric resonator antenna (DRA) design; Terahertz (THz) antennas; Smart Antennas, Antenna array design for 5G MM-Wave; Adaptive Beamforming; Power Divider Network for Array; Fractal Antenna; Phased Array Antenna; Wearable and Conformal Arrays; Array Pattern Synthesis; Evolutionary Algorithms. Transmitter/receiver design, Fast Addar, Multiplier, multiply-divide unit.
- ➢ **Part-Time/Self-Financed/Sponsored:** Infrared Thermography, Nanodevices, Applied Instrumentation, Agriculture Electronics, Microwave imaging, inverse problems, ground penetrating radar, AI in medicine, AI and ML for sensors at nanoscale, RF and Microwave Engineering, Antennas, Passive microwave Circuits, AI and Microwaves, Microelectronics, VLSI Design, Analog and Mixed Signal Design, AI assisted VLSI circuits, Microelectronics, Digital and Analog VLSI, FPGA based digital design implementation, Network on CHIP. Low power Active filter circuit Design, Signal processing for wireless communication, Machine learning for 6G and beyond Standard, Image Denoising, Biomedical image Analysis, Image Classification, Object Tracking, Ultrasound signal analysis, FPGA Based Image Processing Applications, ECG Signal Analysis,

Machine Learning, Semiconductor Devices (BiCMOS, BJTs, MOSFETs, TFETs etc.), VLSI CIrcuit Designs, VHDL, VERILOG, System Verilog, FPGA & ASIC, Microstrip Antenna Design; dielectric resonator antenna (DRA) design; Terahertz (THz) antennas; Smart Antennas, Antenna array design for 5G MM-Wave; Adaptive Beamforming; Power Divider Network for Array; Fractal Antenna; Phased Array Antenna; Wearable and Conformal Arrays; Array Pattern Synthesis; Evolutionary Algorithms.

❖ Civil Engineering (CVE)

➢ **Full-time (with scholarship):** Sustainable Geotechnics, Soil behaviour under static/cyclic conditions, Clay minerology and microstructural aspects, Unconventional earth reinforcements, Environmental Geotechnology, Artificial Neural Networks in Geotechnical Engineering, Transportation Geotechnics.
➢ **Part-Time/Self-Financed/Sponsored:** Sustainable Geotechnics, Soil behaviour under static/cyclic conditions, Clay minerology and microstructural aspects, Unconventional earth reinforcements, Environmental Geotechnology, Artificial Neural Networks in Geotechnical Engineering, Transportation Geotechnics.

❖ Mechanical Engineering (MCE)

➢ **Full-time (with scholarship):** Numerical and Experimental Fluid Flow and Heat Transfer, Microfluidics, Cooling Technologies, Energy Harvesting, Multiphase Flow and Heat Transfer, Micro and Nano Heat Transfer, Design for manufacturing and Assembly, Applied Ergonomics, Virtual Reality

➢ **Part-Time/Self-Financed/Sponsored:** Numerical and Experimental Fluid Flow and Heat Transfer, Microfluidics, Cooling Technologies, Energy Harvesting, Multiphase Flow and Heat Transfer, Micro and Nano Heat Transfer, Reverse Engineering, Product Design for Elderly and Kids, Design for manufacturing and Assembly, Quality and Reliability, Sustainability.

❖ Applied Sciences (APS)

➢ **Full-time (with scholarship):**
Mathematics: Applied Mathematics, Hydrodynamic Stability, Non-Newtonian Fluids, Fluid Instabilities, Artificial Intelligence and Machine Learning, Numerical Optimization and Simulation, Biomedical Imaging, Inverse Problems, Partial Differential Equations, Fractional Differential Equations, Mathematical Biology, Finite Element Methods.
Physics: Photonics: Fiber Optic Sensors; & Materials Science: Microwave Absorption Materials, Thin Film Coatings and Gas Sensors.
Chemistry: (i) Electron Paramagnetic Resonance (EPR) of Transition Metal Ions and Organic Free Radicals.
(ii) Electron Spin Relaxation Time And Its Mechanism.
(iii) Distance Measurement Between Sites In Biomolecules.
(iv) Application of EPR towards Biology.
(v) Chemistry of Lanthanides and Actinides.

➢ **Part-Time/Self-Financed/Sponsored:**
Mathematics: Applied Mathematics, Hydrodynamic Stability, Non-Newtonian Fluids, Fluid Instabilities, Artificial Intelligence and Machine Learning, Numerical Optimization and Simulation, Biomedical Imaging, Inverse

Problems, Partial Differential Equations, Fractional Differential Equations, Mathematical Biology, Finite Element Methods.

Physics: Photonics: Fiber Optic Sensors; & Materials Science: Microwave Absorption Materials, Thin Film Coatings and Gas Sensors.

Chemistry: (i) Electron Paramagnetic Resonance (EPR) of Transition Metal Ions and Organic Free Radicals.

(ii) Electron Spin Relaxation Time And Its Mechanism.

(iii) Distance Measurement Between Sites In Biomolecules.

(iv) Application of EPR towards Biology.

(v) Chemistry of Lanthanides and Actinides.

❖ Humanities and Social Sciences (HSS)

➤ **Full-time (with scholarship):**
   English: Culture Studies,
   Economics: R&D, Innovation, Intellectual Fellowship Property Rights and Sustainable Development.

➤ **Part-Time/Self-Financed/Sponsored:**
   English: Culture Studies.
   Economics: R&D, Innovation, Intellectual Fellowship Property Rights and Sustainable Development.

4. Reservation Chart (for Full-time with scholarship)

OPEN	OPEN-PwD	EWS	EWS-PwD	OBC	OBC-PwD	SC	SC-PwD	ST	ST-PwD
39	1	9	1	26	1	14	1	6	1

The final student intake is subject to availability of Supervisor.

5. Important Instructions

- Candidates MUST specify broad areas of research in the application form.
- **The candidates with INSPIRE, UGC-CSIR Fellowships or any such fellowships can apply under Full-Time category irrespective of vacancies.**
- Institute reserves the right to reject the application(s) if a faculty member is not available to guide the candidate(s) in his/her proposed research area.
- Incomplete application forms and forms submitted after the last date will be rejected.
- Canvassing in any form will lead to rejection of application form.
- The candidates are required to see our Institute website for fee structure and faculty expertise and are also advised to visit our Institute website regularly for the updates.
- The candidates are advised to read the NIT Goa Ph. D Rules and Regulations for detailed programme structure.
  (https://www.nitgoa.ac.in/uploads/PhD%20(Rules%20&%20Regulations)_March%202024.pdf)

6. Selection Procedure

The admission to Ph.D. Programme will be based on the criteria given below:
  a) Overall academic performance and written test conducted by the respective Department.
  b) Performance in personal interview.

- The candidates shortlisted in the written test will be called for the personal interview.
- Short-listed candidates for written test and personal interview will be uploaded on the Institute website. No separate intimation will be sent to the applicants.
- All candidates selected for admission shall be required to deposit the requisite Institute fee and produce necessary original documents at the time of admission.

7. Fee Structure for the year 2024-25

The applicants may refer the Institute fee structure at the below link:

https://www.nitgoa.ac.in/static/fee_structure_23-24_25july2023.pdf

Fee structure may be changed from time to time as per the Institute norms.

8. Scholarship Requirement

A GATE qualification obtained by candidate at some point in time in the respective disciplines or other eligible fellowships such as JRF/UGC/NET/CSIR/DST-INSPIRE etc. in the respective disciplines or qualification in any other national level tests as specified by the norms of GoI from time to time.

9. Facilities and Opportunities for Ph. D scholars

- Financial support for meritorious scholars to attend International Conferences in abroad.
- Financial support for contingency expenses and attending workshops/conferences in India.
- Exposure to the latest technological trends and developments through various institutional programs and activities.
- Newly inaugurated campus with state-of-the-art facilities.
- Access to selected top-tier research journals and research databases.
- Single room hostel accommodation for Ph. D scholars in the new campus at Cuncolim
- 24 hours access to academic resources including laboratories.

10. How to apply

Applicants must apply through online portal **http://mis.nitgoa.ac.in/PhDApplication/** only.

While filling-in the online application, attention must be paid to the following:

- Applicants are instructed to apply through **ONLINE** only.
- Applicants must fill/enter their CGPA or percentage of marks as issued by their Institute/University.
- Online application once submitted by the applicants shall be considered final and binding. Requests for making corrections in the online application shall not be entertained once the final submission is made.
- Each application must accompany an application fee of **Rs. 500/-** per Department for Gen/OBC(NCL)/EWS applicants and **Rs. 300/-** per Department for SC/ST/PwD applicants. Applications to more than one Department shall be considered only upon payment of the requisite fees for each Department. Application fee is non-refundable.
- The fee payment should be made through online mode only, on or before the last date <mark>(24 May 2024, 5 PM) **15 June 2024, 5 PM**</mark>
- Candidates can pay the application fee online using Debit/Credit Card/UPI/Net Banking etc.
- Candidates are instructed to send the softcopy (PDF) of their finally submitted application (without enclosures) to **phdadmissions@nitgoa.ac.in** with mail subject: **"Ph. D Application June 2024 - User ID".**

11. Supporting Documents

Applicants MUST be ready with the following scanned documents, whichever applicable, while submitting the online Ph.D. application form.

i.   One recent passport size photograph of the candidate.
ii. GATE/UGC/CSIR/NBHM/NET qualified certificate. (For Full-Time with scholarship)
iii. Master's Degree/Provisional certificate. If the result of qualifying degree is awaited, **certificate of course completion** from the institute/university last studied must be provided in the prescribed format. **(Refer Annexure - I)**
iv. Undergraduate degree certificate and marks sheet.
v.   Certificate of Matriculation /X class as the proof of age of the candidate.
vi. Certificate of category (SC/ST/OBC-NCL/EWS), if applicable, as per Government of India format **(Refer Annexure - I)**, issued by the competent authority. In case of OBC-NCL/EWS category, the certificate must **be issued on or after April 01, 2024.**
vii. Undertaking by the candidate on OBC-NCL status in the prescribed format **(Refer Annexure - I)**
viii. Certificate for Persons with Disabilities (PwD), if applicable, issued by the competent authority. **(Refer Annexure - I)**
ix. No Objection Certificate (NoC) from the Employer/Industry **(Refer Annexure - I)**
x.   Sponsorship Letter for Sponsored Ph.D. Program **(Refer Annexure - I)**

Note: If the original certificates are not in English/Hindi, English/Hindi version/translation of such certificates, duly certified by the Principal/Director or other competent authority of the graduating institute, will be required during the document verification.

(Incomplete/incorrect applications without necessary supporting documents will not be considered).

12. Legal Jurisdiction

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

13. Important Dates

S. No.	Particulars	Date
1.	**Start of Online Application (Website Open)**	**25 April 2024 (10 AM)**
2.	**Last Date for submission of Online application (Website Closure)**	~~**24 May 2024 (5 PM)**~~ **15 June 2024, 5 PM**
3.	**TENTATIVE Schedule for Written Test*/Interview**	**1-3 July 2024**

*NOTE: Intimation regarding written test/personal interview will be posted on the Institute website. No separate interview letter/communication will be sent to individual candidates. Visit Institute website: www.nitgoa.ac.in regularly for more details and updates.

Disclaimer

The Institute reserves the right to make changes at any time without notice, changes in and additions to the regulations, conditions governing the admission, requirements, seats, fee and any other information, or statements contained in this information brochure.

For further queries, Contact:

The Chairman (Ph. D Admissions)
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The Chairman (Ph. D Admissions)