



NATIONAL INSTITUTE OF TECHNOLOGY CALICUT

NIT CAMPUS POST, CALICUT, KERALA - 673 601, INDIA

Information Brochure for Ph.D. Programmes - July 2018

GENERAL INFORMATION

ABOUT THE INSTITUTE

National Institute of Technology Calicut (NITC) is one of the premier national institutions for technical education in India. This was formerly known as Calicut Regional Engineering College. NITC is a technical institution of national importance set up by an Act of Parliament. NITC offers academic programmes leading to B.Tech., B. Arch., M.Tech., M.Plan., MCA, M.Sc, MBA and Ph.D. degrees in the appropriate disciplines. NITC is engaged in a wide spectrum of activities covering research and development, industrial consultancy, continuing education and faculty & staff development.

VISION

International standing of the highest caliber

MISSION

To develop high quality technical education and personnel with a sound footing on basic engineering principles, technical and managerial skills, innovative research capabilities and exemplary professional conduct to lead and to use technology for the progress of mankind, adapting themselves to the changing technological environment with the highest ethical values as the inner strength.

LOCATION

Set in a picturesque landscape at the foothills of the Western Ghats, NITC is located about 22 km north-east of Calicut city in the state of Kerala, India. It stretches over a length of about 1.5 km along the Calicut-Mukkam road, extending over an area of approximately 120 hectares. The nearest airport is Calicut which is about 45 km away from the campus.

INFRASTRUCTURE FACILITIES

The Institute has well equipped library, computer centre, seminar halls, lecture hall complexes, various laboratories in different departments, workshops, hostels for accommodating students, health care centre and adequate facilities for sports, games and co-curricular activities. The main computer centre has all the relevant software packages and latest computers with internet facilities. To provide service to the campus residents, State Bank of India, Post Office, Canteen & Co-operative Store are also functioning in the campus.

STUDENT SUPPORT SERVICES

The Institute has Training and Placement department that looks after the training needs of the students, their placement of jobs on graduation. An Entrepreneurship Development Cell promotes the students for self-employment. A Technology Business Incubator (TBI) with the assistance from Department of Science and Technology, Government of India is being established. TBI helps in incubating knowledge based start-ups into sustainable business with single window system.

DISTINGUISHED ALUMNI

A vast majority of the former students have made immense impact in the professional areas such as academics, administrative services, research laboratories, government and private industries. A strong network of alumni thrives in India as well as in foreign countries and is known as RECCAA.

ADMISSION TO Ph.D. PROGRAMMES

INTRODUCTION

The following Departments /Schools are inviting application for Ph.D. programme in July 2018 admission:

Department	Code	Department	Code
Architecture and Planning	AR	Mathematics	MA
Chemical Engineering	CH	Mechanical Engineering	ME
Chemistry	CY	Physics	PH
Civil Engineering	CE	School	Code
Computer Science and Engineering	CS	Biotechnology	BT
Electrical Engineering	EE	Management Studies	MS
Electronics & Communication Engineering	EC	Nano Science and Technology	NS

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

- (I) **FULL-TIME (FT)**
- (II) **PART-TIME (PT)**
- (III) **INTERNAL (IN)** and
- (IV) **EXTERNAL (EX).**

Ph.D. fellowships are available for candidates under Full-time scheme.

For the Part-time and External schemes of registration, the applicant must be an permanent employee of a recognized institution/organization with at least two years of service and be engaged in professional work in the area to which admission is sought.

Candidates under Part-time scheme will have to submit no objection certificate from the Head of the institution.

External registration is available only for candidates sponsored by and employed in recognized research institutions such as Research and Development Organizations / National Laboratories/ and Industries having R & D facilities recognized by Department of Science and Technology. A candidate applying for admission to the external registration programme must provide detailed information about the research facilities available at his/her organization and must produce a certificate from a competent authority specifying that these facilities would be available to him/her for carrying out research. He/She should also provide the bio-data of the prospective supervisor who would supervise the candidate's work at his/her organization. External registration will be granted only when a qualified research guide is available in the sponsoring institution and is willing to guide the candidate along with a guide in NITC. Candidates from educational institution are not eligible under external scheme.

Registration under Internal (IN) scheme is available only to regular employees of the Institute. The Institute offers Ph.D. programmes under part time scheme for permanent/contract faculty member and research staff of the Institute if they apply for the same at the normal time for admission with the recommendation of the Head of the department in which he/she is employed.

Those who are working on research projects in which he/she is working should be in force for at least two or more years. A certificate to this effect from the Principal Investigator/Head of the Department concerned should be attached to the application form. If an employee who has registered as a part time research scholar resigns his/her job before the minimum period required for the Ph.D. work, his/her registration shall stand automatically cancelled. However, if he/she has completed the course work and comprehensive examination and the required minimum period, he/she can be allowed to continue the research works if the Doctoral Committee of the research scholar recommends the same.

ELIGIBILITY & ACADEMIC REQUIREMENTS FOR ADMISSION TO Ph.D. PROGRAMMES

The candidates for Ph.D. Programmes may be offered admission, based on certain minimum academic requirements to be satisfied by the candidates as given below:

The maximum age for admission to Ph.D. programme is 50 years.

I. Faculty of Engineering:

M.Tech. Degree in Engineering/Technology in the appropriate branch of study with minimum 60% marks (CGPA 6.5/10) [For SC/ST candidates, the minimum mark is 55% (CGPA 6.0/10)].

Candidates shall be required to have passed the **four-year regular full time** B.E./B.Tech. Degree in an appropriate branch with minimum 60% marks (CGPA 6.5/10) in aggregate in the qualifying examination. [For SC/ST candidates 55% marks (CGPA 6.0/10)].

Candidates under lateral entry should have passed the three year diploma in engineering with minimum 60% marks [For SC/ST candidates 55% marks (CGPA 6.0/10)].

II. Faculty of Architecture:

Master's degree in Architecture/Design/Planning/Engineering/Technology or its equivalent with minimum 60% marks (CGPA 6.5/10) [For SC/ST candidates, the minimum mark is 55% (CGPA 6.0/10)].

Candidates should possess minimum 60% marks (CGPA 6.5/10) or equivalent **both** in Bachelors and Masters degrees. For SC/ST candidates 55% (CGPA 6.0/10) or equivalent **both** in Bachelors and Masters degrees.

III. Faculty of Nanoscience & Technology:

M.Tech. Degree in any discipline of Engineering/Technology/Nanoscience & Technology with minimum 60% marks (CGPA 6.5/10) [For SC/ST candidates, the minimum mark is 55% (CGPA 6.0/10)].

OR

Master's degree in Chemistry/Physics/Life science/Nanoscience and Technology with minimum 60 % marks (CGPA 6.5/10) or equivalent, [for SC/ST candidates, the minimum mark is 55% (CGPA 6.0/10)] and a valid GATE score or UGC/CSIR/NBHM/NET/KSCSTE fellowship in the relevant area, tenable from the current year.

Candidates should possess minimum 60% marks (CGPA 6.5/10) or equivalent **both** in Bachelors and Masters degrees. For SC/ST candidates 55% (CGPA 6.0/10) or equivalent **both** in Bachelors and Masters degrees.

Candidates applying for External and Part-time scheme of registration do not require GATE score or UGC/CSIR/NBHM/NET/KSCSTE fellowship.

IV. Faculty of Biotechnology:

M.Tech. Degree in Biotechnology/Life Science with minimum 60% marks (CGPA 6.5/10) [For SC/ST candidates, the minimum mark is 55% (CGPA 6.0/10)].

OR

Master's degree in Life science with minimum 60 % marks (CGPA 6.5/10) or equivalent, [for SC/ST candidates, the minimum mark is 55% (CGPA 6.0/10)] and a valid GATE score or fellowships such as UGC/CSIR/NBHM/NET/KSCSTE/DBT in the relevant area, tenable from the current year.

Candidates should possess minimum 60% marks (CGPA 6.5/10) or equivalent **both** in Bachelors and Masters degrees. For SC/ST candidates 55% (CGPA 6.0/10) or equivalent **both** in Bachelors and Masters degrees.

Candidates applying for External and Part-time scheme of registration do not require GATE score or fellowships such as UGC/CSIR/NBHM/NET/KSCSTE/DBT.

V. Faculty of Science (Chemistry, Physics and Mathematics):

Master's degree in Mathematics/Statistics/Chemistry/Physics/Electronics/Computer Science & Applications/ Nano Science & Technology/ Material Science/ Photonics OR M.Tech in relevant disciplines related to the major areas of research available in the department with minimum 60% marks (CGPA 6.5/10) or equivalent, (for SC/ST candidates, the minimum mark is 55% (CGPA 6.0/10)] and a valid GATE score or UGC/CSIR/NBHM/NET/JEST/KSCSTE fellowship in the relevant areas tenable from the current year.

Candidates applying for External and Part-time scheme of registration do not require GATE score or UGC/CSIR/NBHM/NET/JEST/KSCSTE fellowship.

Candidates should possess minimum 60% marks (CGPA 6.5/10) or equivalent **both** in Bachelors and Masters degrees. For SC/ST candidates 55% (CGPA 6.0/10) or equivalent **both** in Bachelors and Masters degrees.

VI. Faculty of Management Studies:

Candidates should possess minimum 60% marks (CGPA 6.5/10) or equivalent **both** in Bachelors and Masters degrees in a relevant area from an Institution recognized by UGC/AICTE [For SC/ST candidates 55% (CGPA 6.0/10) or equivalent **both** in Bachelors and Masters degrees].

In addition, the candidates should have a valid UGC/NET/CSIR/JRF fellowship in the relevant areas tenable from the current year.

Candidates who have master's degree in engineering and technology with GATE score, OR applying for internal/external/part-time scheme of registration, OR have managerial experience for not less than five years in a reputed organization do not require UGC/NET/CSIR/JRF fellowship.

CANDIDATES HOLDING DEGREES FROM FOREIGN UNIVERSITIES:

Candidates holding degrees from foreign universities should 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, applications with degrees from well reputed foreign institutions will be considered by an expert committee constituted in this regard.

SELECTION OF CANDIDATES

The admission to Ph.D. Programmes will be on the basis of **written test and/or interview**, by the respective Department/School.

SALIENT FEATURES OF Ph.D. PROGRAMMES

Ph.D. Programmes of the Institute are structured around certain minimum number of theory courses, which have to be passed by the scholars, a comprehensive viva-voce examination, a pre-Ph.D. examination and a Thesis work, which will be examined by a Thesis Board and an Oral Board. Only on the basis of the successful completion of all the Graduation Requirements, a scholar will be awarded Ph.D. degree by the Board of Governors of the Institute based on the recommendation of the Senate.

Semester Registration

Every scholar whether working on Full Time or Internal or External or Part-time registration scheme will have to **register every semester till the submission of thesis**, by payment of tuition and other fees as applicable, on the date announced for registration. Generally, registration for Monsoon semester will be in July/August and Winter semester in December/January.

Course Work and Thesis Work Requirements

Each scholar admitted to Ph.D. programme must necessarily earn a certain minimum number of credits through course work and research work as given in the table below:

Minimum qualification at the time of admission	Minimum Credits requirement	Minimum period for thesis submission		Maximum period for thesis submission	
		Full-time	Internal, External & Part-time	Full-time	Internal, External & Part-time
M.Tech./ M.Arch. / M.Plan.	12*	30 months/ 5 Semesters	36 months/ 6 Semesters	5 years	7 years
M.Sc./M.A	15*	30 months/ 5 Semesters	36 months/ 6 Semesters	5 years	7 years

* In addition to these credits, every research scholar should credit a course on Research Methodology and secure a pass.

All research scholars will have to credit all the courses prescribed for study and obtain a minimum letter grade of C in each subject and must obtain at least an overall CGPA of 7.0. **The minimum residential requirement for External and Part-time Scheme Scholars is one semester.**

Monitoring the Work and Progress: Each research scholar will be assigned a Supervisor (Not more than two) by the Head of the Department. The work and progress of the scholars will be monitored by a Doctoral Committee specially appointed for each scholar. Only with the approval of the Doctoral Committee, the courses of study shall be prescribed.

A research scholar shall appear before the Doctoral Committee minimum once in every year for progress evaluation. Progress evaluation meetings of the Doctoral Committee will be convened by the guide. Research scholar shall submit a report of his/her work completed; to the DC members and make a presentation on the progress of his/her work in the DC meeting. If the progress of the research scholar is not satisfactory, the Doctoral Committee shall record the reasons for the same and warn the research scholar and suggest corrective measures. If the performance of scholar is still not satisfactory in the following semester/year, DC may recommend suitable actions including cancellation of registration.

The progress of the research scholar will be categorized as Very Good/Good/Satisfactory/Unsatisfactory by the Doctoral Committee and recorded in the progress evaluation report. The research scholar is free to publish the results of his/her research work with the consent of his/her guide. Patents, if any, based on his/her contributions shall be applied by the guide as per the Institute rules. The guide (if necessary after convening DC) shall evaluate the progress of the scholar in the research any time during the programme.

HoD will grant permission to the scholar for registration to every semester based on the recommendation of the guide(s)/DC.

Eligibility for the Award of Degree: The Ph.D. thesis submitted by the scholar will be evaluated by two external examiners, one from India and another from abroad, both being experts in the concerned area of the research. On receipt of satisfactory thesis evaluation reports from both the examiners, an Oral Examination Board will be constituted by the Chairman Senate for the conduct of the thesis defense /oral examination. The members of the Board will include one of the external examiners, thesis supervisor(s) and another examiner appointed by the Chairman of the Senate with the Head of the Department (if he is a guide then the former Head) as Chairman. The scholar will be declared eligible for the award of the degree only if the Oral Examination Board recommends the same after successful defense of the thesis and has completed other requirements as per the Ph.D. regulations.

Graduation Requirements: All Ph.D. scholars irrespective of the type of registration will have to complete the following requirements for Graduation:

- Credited the minimum number of theory courses prescribed and earned the minimum CGPA stipulated
- Successfully completed the Comprehensive Viva-Voce Examination
- Presented a Work on Account report and completed the Pre-Ph.D. Examination
- Successfully presented an Open Defense of his/her thesis
- Obtained positive recommendations both from the external examiners and the Oral Examination Board

Financial Assistance

A few research fellowships are available to full time research scholars who are not receiving any financial support/ scholarship from other Agencies or State or Central Governments. They are required to assist the Department in the academic work for at least 8 hours per week as per guidelines issued by the Ministry of Human Resources and Development, Govt. of India, in addition to satisfying other conditions for the award /renewal of the fellowship. The present rates for Ph.D. fellowships are as follows:

I & II Year	III, IV & V Year
Rs 25,000 per month	Rs. 28,000 per month

FINANCIAL REQUIREMENTS

Fee structure for the Ph. D Programme 2018-19 admissions will be published in the website before the admission.

MAJOR AREAS OF RESEARCH

ARCHITECTURE AND PLANNING

- Urban and Regional Planning
 - Transportation
 - Infrastructure
 - Housing
 - Environmental Planning
 - Planning Informatics
- Architecture
 - Urban Design
 - Landscape
 - Conservation
 - Architectural Theory
 - Architectural Visualization & Product Design
- Sustainable Building Design
 - Building Services
 - Energy Modelling
 - Building Information & Management
- Building Technology & Management
 - Alternate Building Materials
 - Construction Management

CHEMICAL ENGINEERING

- Waste Water Treatment
- Materials Technology
- Energy Technology
- Biochemical Engineering
- Clean Coal Research & Development
- Polymer Technology

CHEMISTRY

- Materials Chemistry & Technology (Polymers, Blends, Composites, Membranes)
- Organic & Bio-organic Chemistry
- Porphyrins and Metalloporphyrins
- Theoretical and Computational Chemistry
- Bio-inorganic Chemistry
- Soft Materials
- Waste Management

CIVIL ENGINEERING

- Structural Engineering
- Strength and Behaviour of Offshore Structures
- Traffic and Transportation Planning
- Water Resources Engineering
- Geotechnical Engineering
- Environmental Engineering
- Construction Project Management
- Sustainability and Development of Building Materials

COMPUTER SCIENCE & ENGINEERING

- Parallel and Distributed Computing Systems
- Intelligent Systems
- Programme Analysis
- Algorithms and Complexity
- Information Management & Security

ELECTRICAL ENGINEERING

- Power & Energy Systems
- High Voltage Engineering
- Electrical Machines & Power Electronics
- Control and Signal Processing
- Biomedical and Instrumentation
- Industrial Power & Automation

ELECTRONICS & COMMUNICATIONS ENGINEERING

- Speech/Audio/Image/Video Processing
- Multi-rate Signal Processing and Filter banks
- Wireless Communications and Networks
- Cryptography and Secure Communication
- Microelectronics and VLSI
- Micro/Nano Electro Mechanical System (MEMS/NEMS)
- Signal Theory
- Compressed Sensing/Sparse Signal Processing
- Machine Learning

MATHEMATICS

- Discrete and Fuzzy Mathematics
- Stochastic Modelling and Applied Statistics
- Numerical Analysis and Scientific Computing
- Mathematical Analysis
- Nonlinear Dynamics
- Operations Research

MECHANICAL ENGINEERING

- **Industrial Engineering and Management Stream:**
 - Ergonomics
 - Supply Chain Management
 - Marketing Management
 - Human Resource Management
- **Machine Design Stream:**
 - Computational Mechanics
 - Robotics
 - Tribology
 - Machine Dynamics
- **Materials and Manufacturing Stream:**
 - Macro and Micro Machining
 - Modern Machining
 - Metrology
 - CAD/CAM
 - Composite Materials
 - Ferrous and Non-ferrous Metallurgy
- **Thermal and Energy Engineering Stream:**
 - Renewable Energy Technologies
 - Energy Conservation
 - Fuel Cells and Hydrogen Technology
 - Computational Fluid Dynamics
 - Heat Pipes
 - Cryogenics
 - Jets and Flow Acoustics

PHYSICS

- Organic Solar Cell, Nano material for Energy Applications
- Organic & Hybrid Electronics & Photonics
- Graphene Photonics and Carbon Quantum Dots
- Nonlinear Optics and Nano Photonics
- Statistical mechanics of phase transitions – Soft condensed matter Systems
- Computational Modeling of Materials
- Environmental Monitoring using principle of Optics

SCHOOL OF BIOTECHNOLOGY

- Enzyme Technology
- Cancer Research

SCHOOL OF MANAGEMENT STUDIES

- Economics
- Econometrics
- Literature, Language and Linguistics
- Art and Cultural Studies
- Literary Theory

SCHOOL OF NANO SCIENCE AND TECHNOLOGY

- Nano-materials and their applications
- Nano-fluids
- Photo Catalysis/Water Splitting
- Biomaterials
- Corrosion and Wear Resistant Coating
- Nano Composites for Energy

HOW TO APPLY?

1. Apply online using the following link:

<http://www.dss.nitc.ac.in/mtechapp/PhD/frmLogin.aspx>

2. Before you start filling-in the online application form, register with your e-mail id and mobile number for creating a login in the online portal.

Before login, keep the following documents ready with you.

- Softcopy of your recent PHOTOGRAPH for uploading in the online application (Maximum of 120 kB)
- Aadhaar Card
- 10th class certificate
- Mark lists of the Under graduate and Post graduate degree programme
- Details of the research publications in Journals and Conferences
- Demand Draft towards application fee

3. On submitting the online application, you will be directed to upload a recent PHOTOGRAPH (Maximum of 120 kB) of the candidate. **Finally, a printout of the application is to be taken and send by post to the address given below.** To view 'the application to be printed', you require an Adobe Acrobat Reader 6 or higher.

4. Candidates applying for the admission to **different departments / schools** will have to mention the corresponding codes in the appropriate columns in the Application Form. If a candidate is applying for **more than one department/school, the candidate must submit separate application forms with separate Demand Draft.**

5. *Six copies of the same photograph (uploaded in the application) and one stamp size photograph should be produced at the time of counselling/admission.*

6. **Demand Draft towards application fee (Rs. 600/- for Open and OBC candidates, Rs. 300/- for SC/ST/PH candidates) drawn in favour of “Director NIT Calicut” payable at State Bank of India, NIT Calicut Branch (Code No. 2207) is to be enclosed.**
7. The following documents arranged in the order given below should be enclosed along with the application (whichever is applicable):
- i. Research Proposal (use separate single sheet, 500 words approximately)
 - ii. Self attested copy of proof of date of birth.
 - iii. Self attested copy of Mark lists & Degree certificate of the Under Graduate Programme.
 - iv. Self attested copy of Mark lists & Degree/Provisional certificate of the Post Graduate Programme.
 - v. Candidates who are appearing for their final examination and are awaiting results should produce all original mark lists up to and including third semester of the Post Graduate Programme. **Such candidates will be considered for provisional admission provided they will be able to submit the degree certificate/ provisional certificate and final mark list (satisfying the eligibility criteria) by 15th September 2018.** They have to produce a certificate from the Head of the Institution stating that he/she has appeared/appearing for the final semester examination (Thesis Viva-voce examination) of the Post Graduate Programme.
 - vi. Self-attested copy of valid GATE score or UGC/CSIR/KSCSTE/NBHM/NET/JEST/DBT fellowship in the relevant areas tenable from the current year, if applicable.
 - vii. Self attested copy of community certificate in the case of SC/ST candidates from a competent authority (**not below the rank of a Tahsildar**).
 - viii. Self attested copy of community certificate in the case of OBC candidates from a competent authority (**not below the rank of a Tahsildar**) indicating that the candidate does not belong to the Creamy Layer for the financial year ending 31st March 2018.
 - ix. Self attested copy of experience certificates.
 - x. Sponsorship certificate duly filled by the sponsoring authority on their letter head with the seal of the sponsoring authority in the prescribed format, in the case of external candidate.
 - xi. The following additional documents, are necessary in the case of external candidates: (a) Details regarding the research facilities available at his/her organization for his/her research work (b) Certificate from the head of the institute/competent authority stating that these facilities will be made available to him/her if required for carrying out research and that he/she will be granted leave for completing the course/residential requirements at NIT Calicut as per Ph.D. regulations of the Institute (c) Bio-Data of the prospective supervisor who would supervise the candidate's work at his/her organization (d) Prospective supervisor's consent letter.
 - xii. No objection certificate duly signed by the Head of the institution, in case of part-time candidates. (In case of internal candidates, a No Objection Certificate from the Head of the department is required).
 - xiii. Self-attested copy of all research publications in Journals and Conferences.
 - xiv. Demand draft towards application fee as per the category of the candidate.
8. **Printout of the Application with all the above enclosures should be sent (in A4 size cover) by Post so as to reach the following address on or before 09th May 2018.**
- Chairperson – PG Admissions,
National Institute of Technology Calicut,
NIT Campus PO,
Calicut - 673 601, Kerala.**
9. The status regarding the selection for test and/or interview for the admission to the Ph.D. programme will be available in our website in due course. **No separate call letter for test and/or interview will be dispatched.**

IMPORTANT DATES

Events	Dates
Availability of Online Application in the Institute website	4 th April to 3 rd May 2018
Last date for receipt of completed Application in printed form by Post	9 th May 2018
Test and/or Interview	19 th and 20 th June 2018
Date of Admission and Reporting for the Programme	19 th July 2018 (tentative)

Schedule for Test and/or Interview for the various Departments/Schools	
19 th June 2018	20 th June 2018
Chemical Engineering (CH)	Architecture (AR)
Computer Science and Engineering (CS)	Biotechnology (BT)
Electrical Engineering (EE)	Chemistry (CY)
Mathematics (MA)	Civil Engineering (CE)
Mechanical Engineering (ME)	Electronics & Communication Engineering (EC)
Physics (PH)	Nano Science and Technology (NS)
	Management Studies (MS)

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.

Address for Correspondence

Chairperson – PG Admissions
National Institute of Technology Calicut
NIT Campus P.O. Calicut 673 601
Kerala, India

Telephone: 0495 2286119

E-mail: pgadmissions@nitc.ac.in

Website: <http://www.nitc.ac.in/index.php?url=admission/index/35>
