

# PhD Admissions

Information Brochure | Spring Semester 2022-23



**Academic Office**  
Indian Institute of Technology Goa

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## 01. Eligibility criteria for PhD admission

### a. Full time PhD programme

- i. Applicants must have one of the following in appropriate subject areas.
  1. Master's Degree in Engineering/Technology or equivalent degree with 60% marks or CPI 6/10 or equivalent. (55% marks or CPI 5.5/10 or equivalent for SC/ST).
  2. Bachelor's degree or equivalent degree in Engineering/Technology with 70% marks or CPI 7/10 or equivalent. (65% marks or CPI 6.5/10 or equivalent for SC/ST)
  3. Master's degree in science, arts, social sciences, or equivalent degree with 60% marks or CPI 6/10 or equivalent. (55% marks or CPI 5.5/10 or equivalent for SC/ST).
- ii. Applicants must also fulfil one of the following additional requirements.

#### **1. For engineering stream:**

- a. Qualified GATE score in the relevant streams. (Candidates with B.E. /B.Tech/MCA/M.Sc. degree or equivalent relevant degree must have a valid GATE scorecard).
- b. Junior Research Fellowship (JRF) of CSIR/ UGC/ NBHM/ DBT/ ICAR/ ICMR/ ICPR Fellowship in the relevant streams.
- c. B.Tech/Dual degree from IIT with a CPI/CGPA of 8.0 or more.
- d. Minimum of 2 years of professional experience. (Acquired after obtaining the qualifying degree and completed before the start of the semester in which admission is sought) in the relevant areas. (Applicable to B.Tech/B.E. /MCA/M.Sc. qualifying degree candidates).

#### **2. For science stream:**

- a. Valid GATE Score/CSIR-UGC-NET/JEST in the relevant streams.
- b. Junior Research Fellowship (JRF) of CSIR/ UGC/ NBHM/ DBT/ ICAR/ ICMR/ ICPR Fellowship in the relevant streams.

## b. Part-time PhD programme

- i. Applicants must have ONE of the following in appropriate subject areas.
  1. Master's Degree in Engineering/ Technology or equivalent degree with 60% marks or CPI 6/10 or equivalent. (55% marks or CPI 5.5/10 or equivalent for SC/ST) marks or equivalent and a minimum of two (02) years of work experience at the time of application.
  2. Bachelor's degree in Engineering/Technology with 60% marks or CPI 6/10 or equivalent. (55% marks or CPI 5.5/10 or equivalent for SC/ST) or equivalent and a minimum of four (04) years of work experience at the time of application.
  3. Master's degree in Engineering/Technology or equivalent degree with 60% marks or CPI 6/10 or equivalent. (55% marks or CPI 5.5/10 or equivalent for SC/ST) or equivalent from IIT/ IISER/ IIIT/ IISc/ NIT and minimum of one (01) years of work experience at the time of application.
  4. Bachelor's degree in Engineering/Technology or equivalent degree with 80% marks or CPI 8/10 or equivalent (75% marks or CPI 7.5/10 or equivalent for SC/ST) or equivalent from IIT/ IISER/ IIIT/ IISc/ NIT and minimum of one (01) years of work experience at the time of application.

## 02. Application categories for PhD admission

### a. Full-Time or Regular PhD programme

- Teaching Assistantship (TA): Students get fellowship from the institute as per the guidelines by the Ministry of Education.
- TA through Project (TAP): Students get fellowship from the research project and partial support from the institute
- Govt./ Semi Govt. Fellowship Awards such as QIP, CSIR-JRF, UGC-JRF, DAE, CSIR-UGC-NET/JEST, DBT, NBHM, etc.
- Sponsored: A student in this category is sponsored by a R&D organisation, academic institution, government organisation, or industry for doing research in the institute on a full-time basis. The institute does not provide any assistantship/fellowship to such a student.

- Self-financed: A student in this category works full-time or part-time towards the PhD program. The institute does not provide any assistantship/fellowship to such a student.

#### b. Part-Time PhD programme

A student in this category is a professionally employed person (including IIT Goa staff), who pursues the PhD program while continuing the duties of the employment. The institute does not provide any assistance/fellowship to such a student.

- Permanent employees from state or central government universities, colleges, or research institutes and labs
- External - This category refers to a student employed in an R&D organisation/academic institution/industry having adequate research facilities. The research work leading to the PhD degree may be carried out largely in the parent organisation of the candidate under a Local Supervisor from the organisation but with the overall guidance provided by a faculty member (Institute Supervisor) of the AU in which the student is registered.
- Self-sponsored
- Permanent staff of IIT Goa

### 03. Schedule of PhD Admission for spring semester of AY 2022-23

Sr. No.	Particulars	Date
1	Start date of application (online only)	26 Oct 2022
2	Last date for submitting an online application form and completing the payment	15 Nov 2022
3	Commencement of classes for the Spring Semester	02 Jan 2023

The schedule for the written exam/interview will be informed to the shortlisted candidates via email separately.

### 04. Areas of Specialisation

Unless otherwise specified the opening is open to all categories.

Program	Research Area
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<p>Computer Science and Engineering (CSE)</p>	<p><b>Institute TA category:</b></p> <ol style="list-style-type: none"> <li>1. Automata theory, logic in computer science (OBC/SC/ST)</li> <li>2. Machine learning, Data Science, Artificial intelligence, Pattern recognition</li> <li>3. Combinatorics</li> <li>4. Compilers (OBC/SC/ST)</li> </ol> <p><b>Visvesvaraya PhD Scheme:</b></p> <ol style="list-style-type: none"> <li>1. Machine learning, Data science, Artificial Intelligence, Pattern recognition</li> </ol> <p><b>TAP category:</b></p> <ol style="list-style-type: none"> <li>1. Formal methods in Machine learning</li> </ol>
<p>Chemical and Materials Engineering (CME)</p>	<p><b>Institute TA category:</b></p> <ol style="list-style-type: none"> <li>1. Nanomaterials</li> <li>2. Biotechnology</li> <li>3. Energy storage</li> <li>4. CO2 capture and conversion</li> </ol>
<p>Chemistry</p>	<p><b>Institute TA category:</b></p> <ol style="list-style-type: none"> <li>1. Organometallic chemistry and catalysis (EWS/ST)</li> </ol> <p><b>JRF category:</b></p> <ol style="list-style-type: none"> <li>1. Physical Chemistry, Ultrafast Spectroscopy</li> </ol>
<p>Electrical Engineering</p>	<p><b>Visvesvaraya PhD Scheme :</b></p> <ol style="list-style-type: none"> <li>1. Image Processing/DSP (Computational Imaging, Image Restoration, and Inverse Problems): <ol style="list-style-type: none"> <li>a. Must possess a Programming Aptitude to implement and develop algorithms using MATLAB and Python.</li> <li>b. Must have work experience in Image Processing with an excellent grasp of Signal Processing concepts.</li> <li>c. Mathematical and Analytical Skills will be advantageous.</li> </ol> </li> <li>2. VLSI Design</li> <li>3. Robotics</li> </ol>

Mathematics	<p><b>Institute TA category/JRF category:</b></p> <ol style="list-style-type: none"> <li>1. Partial Differential Equations, Numerical Analysis</li> <li>2. Differential Geometry, Complex geometry</li> </ol> <p><b>JRF Category:</b></p> <ol style="list-style-type: none"> <li>1. Stochastic Partial Differential Equations</li> </ol>
Mechanical Engineering	<p><b>Institute TA category:</b></p> <p><b>Domain: Solid Mechanics and Design</b></p> <ol style="list-style-type: none"> <li>1. Mechanics of Composite Materials ( EWS/OBC/SC/ST)</li> <li>2. Granular materials; Mechanics of discrete entities.( EWS/OBC/SC/ST)</li> <li>3. Manipulating single cells using compliant micromechanisms ( SC/ST)</li> </ol> <p><b>Domain: Thermo-fluid Science</b></p> <ol style="list-style-type: none"> <li>1. Large eddy simulation of turbulent flows (SC/ST)</li> <li>2. Topics related green combustion/carbon-free combustion (primarily experimental) (ST)</li> <li>3. High-speed combustion modelling, Aeroacoustic modelling for noise predictions from turbulent and turbulent-reacting flows, Development of an advanced combustion model for predicting various phenomena in turbulent flames. ( EWS/OBC/SC/ST)</li> </ol> <p><b>Domain: Manufacturing and Reliability</b></p> <ol style="list-style-type: none"> <li>1. Manufacturing (ST)</li> <li>2. Design of Experiments and Reliability Studies for Composites in Marine Applications ( EWS/OBC/SC/ST)</li> </ol> <p><b>Part-time:</b></p> <ol style="list-style-type: none"> <li>1. Manufacturing</li> </ol>
Physics	<p><b>Institute TA category (EWS/ST) /JRF category:</b></p> <ol style="list-style-type: none"> <li>1. Theoretical High Energy Nuclear Physics</li> <li>2. Theoretical Condensed Matter Physics</li> </ol> <p><b>JRF Category:</b></p> <ol style="list-style-type: none"> <li>1. Experimental Condensed Matter Physics</li> </ol>

## 05. General Instructions

- a. Candidates are required to apply ONLINE. No downloadable forms are available.

- b. Candidates should be engaged in professional work related to the area of research discipline applied for in part-time PhD
- c. The candidate of PhD (Sponsored) category should submit a Sponsor's Letter from the organisation in which he / she is employed. The sponsoring organisation should give an undertaking in the given format (Appendix A and Appendix B) stating the following
  - i. The candidate will be paid full salary during the PhD program and he/she would be allowed to fulfil the coursework requirement and qualifier examination
  - ii. Leave would be granted to fulfil the coursework and he/she will be allowed to attend the lectures, labs etc. as per the academic schedule of IIT Goa.
- d. For more information regarding the Ph.D. programme, please consult the PhD Manual available at the institute website.

## 06. Application Fee Payment

The application fee is as follows:

Female candidates	: ₹ 100/-
SC/ST/PwD/EWS/OBC-NCL Category candidates	: ₹ 100/-
All other candidates	: ₹ 200/-

The fee can be paid through NEFT/RTGS/UPI. The details of the institute bank details are:

Bank Name	: Union Bank of India
Account Name	: Student Fee Account IIT Goa
Account Number	: 520101260768219
Branch	: Farmagudi
IFSC	: UBIN0913286

Candidates are required to enter a valid UTR/Transaction Number and transaction date in the online application form. The application fee is non-refundable.

## 07. How to Apply

Please read the instructions and proceed for online application portal

1. For New Registration Click on New User Registration.
2. Register with your valid email ID.
3. Fill the branch applying for (Fill separate applications for different programs).
4. Click on submit, you will be redirected to the login page.



5. Login to the portal.
6. Candidates are required to fill details as given in the form and save the form.
7. Candidates are required to upload the recent Passport Photograph (Maximum 200KB), scanned copy of Signature (Maximum 12KB), detailed CV, and Mark sheets as per eligibility (Maximum 400KB), Appendix A or Appendix B(if applicable). The CV should mention the projects completed (bachelors and masters) and awards/recognition you received.
8. The system will not allow you to Submit the application without filling payment details.
9. Fill the payment details carefully (see the corresponding section); once filled cannot be edited.
10. After filling all the details, please Preview and Submit your application form. After Final Submission, the system will not allow any further editing.

PhD students will be provided on/off campus hostel accommodation. They may also avail HRA facility and take permission to stay outside.

For any academic query, please mail to [academic\\_query@iitgoa.ac.in](mailto:academic_query@iitgoa.ac.in) and for any technical issue, please mail to [phd\\_tec\\_issue@iitgoa.ac.in](mailto:phd_tec_issue@iitgoa.ac.in).

Please note meeting the basic eligibility criteria listed in the advertisement doesn't guarantee that the candidate will be shortlisted for the test/ Interview. The decision of the admission committee in this regard will be treated as final.

## 08. Glossary

Institute TA	Institute Teaching Assistantship.
JRF	Govt./ Semi Govt. Fellowship Awards such as CSIR-JRF.
TAP	Teaching Assistantship through Project.

## 09. Annexure

**TAP category:** Formal methods in machine learning

**Funded by: CEFIPRA (Indo-French centre for the promotion of advanced research)**

**About:** Machine learning algorithms are used in various mission-critical areas. For example, aeroplanes, autonomous-driving trains/cars. It is imperative to formally verify that no untoward incident will happen. Formal verification of machine learning algorithms is in a nascent stage of research. The aim of this project is to develop the necessary theoretical ideas, and develop tools and techniques to verify machine learning algorithms.

The work is jointly executed by Dr. Sreejith A V (IIT Goa), Dr. Meenakshi D&#39; Souza (IIIT Bangalore), and Dr. Vincent Penelle (University of Bordeaux).

For more details visit the link <https://www.iitgoa.ac.in/~sreejithav/fmml/index.html>  
For further queries on the project, write to the project investigator Dr. Sreejith A. V (email: [sreejithav@iitgoa.ac.in](mailto:sreejithav@iitgoa.ac.in) ).

**Student pre-requisite:** Candidates should have an interest in discrete mathematics, algorithms, machine learning, and programming.

**Funding details:** The stipend will be equivalent to a regular Ph.D. stipend. In addition, the Ph.D. scholar is expected to spend three months at the University of Bordeaux, France. The project will fund the travel, and accommodation and will also provide a daily allowance.

**Visvesvaraya PhD Scheme: Phase-II:**

IIT Goa has registered for “Visvesvaraya Ph.D. Scheme for Electronics and IT”. An initiative by the Ministry of Electronics and Information Technology, Government of India to promote the research in Electronics System Design and Manufacturing(ESDM) and IT/IT Enabled Services (IT/ITES) sectors in the country.

(Employer's letter: To be submitted on the letterhead of the employer)

To

The Director,

Indian Institute of Technology Goa

Goa 403401

Sub: Employer's Letter for Part-Time Ph.D. Admission under External Candidates Category.

Dear Sir,

With respect to the application of Mr./Mrs./Miss \_\_\_\_\_,

employed as \_\_\_\_\_ (Designation) in our organization, for Part-Time PhD Admission Under External Candidates Category, we hereby undertake the following:

Mr./Mrs./Miss \_\_\_\_\_ will be allowed to take leave as required for completing the coursework requirement and the PhD Qualifying Examination as mandated by IIT Goa. We will continue to pay Mr./Mrs./Miss \_\_\_\_\_ salary as per the HR policies during the period of leave.

Name of Authorized Signatory

Signature of Authorized Signatory

Designation of Authorized signatory

Date:

Contact Details of Authorized Signatory

Employer's Seal:

(Sponsor's letter: To be submitted on the letterhead of the employer)

To  
The Director,  
Indian Institute of Technology Goa  
Goa 403401

Sub: Sponsor's Letter for Part-Time Ph.D. Admission under Sponsored Candidates Category.

Dear Sir,

With respect to the application of Mr./Mrs./Miss \_\_\_\_\_,  
employed as \_\_\_\_\_ (Designation) in our organization, for Part-Time PhD Admission Under Sponsored Candidates Category, we hereby undertake the following:

Mr./Mrs./Miss \_\_\_\_\_ will be allowed to take leave as required for completing the coursework requirement and the PhD Qualifying Examination as mandated by IIT Goa. We will continue to pay Mr./Mrs./Miss \_\_\_\_\_ salary as per the HR policies during the period of leave.

We state that appropriate facilities relevant to the research of Mr./Mrs./Miss \_\_\_\_\_ exist in our organization.

Bio-data of proposed co-supervisor in our organization" Dr. \_\_\_\_\_ who is employed as \_\_\_\_\_ (Designation) is attached with the letter.

Name of Authorized Signatory

Signature of Authorized Signatory

Designation of Authorized signatory

Date:

Contact Details of Authorized Signatory

Employer's Seal: