

Information Brochure  
Admission to Ph. D. Program December Cycle  
Academic Session 2023-24

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NIRF Ranking (Year 2023)

Engineering – 35 | Architecture – 10 | Overall – 66

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Indian Institute of Engineering Science and Technology, Shibpur  
Howrah – 711 103, West Bengal, India  
(Formerly known as Bengal Engineering and Science University, Shibpur)

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## 1. Important Guidelines for Ph. D. Application

Applications are invited for admission to the Ph.D. Program (Institute Fellowship, Individual Fellowship i.e. CSIR/UGC/DBT/ICMR/INSPIRE etc., Sponsored Research Project & Sponsored Candidates categories of the Institute) in the December cycle 2023 in all disciplines of Engineering, Technology, Science, Architecture, Town & Regional Planning, and Humanities & Social Sciences. Admission to the candidates in the reserved category will be done as per the notification of the Government of India. Applicants are required to apply online only at [www.iests.ac.in](http://www.iests.ac.in).

Application fee (nonrefundable) is Rs.1500/- for OC/OBC(NCL)/EWS and Rs.1000/- for SC/ST/PwD candidates.

The candidates are advised to read each and every instruction given in this Information Brochure very carefully before applying online.

- 1.1 A candidate with M.Tech./M.E./Integrated M.Tech /M.Arch./M.Plan./M.T.R.P./M.Sc./M.A. and/or B.Tech. degree fulfilling minimum eligibility criteria (Section 5) can apply to any one of the Departments/Centres/Schools listed in the Table later. No request for considering the candidature in department, other than in which applied, will be entertained.
- 1.2 A candidate can apply more than one Departments/Centres/Schools. Separate application to be made by paying requisite fee for each application.
- 1.3 Selection of candidates will be based on an initial screening followed by their performance in the written test and or interview/counseling for this cycle for all categories of admission. *Appearing in the written test and or interview/counseling process does not give the guarantee of selection.* Candidates have the sole responsibility to be present in the written test and or interview/ counseling process on the scheduled date and time. Institute shall not entertain any appeal in this regard for failing to appear at the scheduled written test and or interview/ counseling process for any reason.
- 1.4 Mere fulfilling of eligibility requirements does not ensure shortlisting. Institute reserves the right to restrict the number of candidates to be called for written test and or interview/ counseling process. Depending on the number of applications received, Institute/Department(s) may set the criteria higher than the minimum eligibility requirements for shortlisting candidates for written test and or interview/counseling process.
- 1.5 IEST, Shibpur shall not be responsible for wrong entries and technical error(s) while making the online application/payment of the fee.
- 1.6 Admission shall be offered subject to the availability of seats, faculty members in the respective specializations and availability of Institute Fellowships.
- 1.7 All candidates are advised to visit regularly the Institute website ([www.iests.ac.in](http://www.iests.ac.in)) for any updates about subsequent amendments in the advertisement and results. No correspondence in any form in this regard will be made by the Institute with an individual candidate.
- 1.8 The admission shall be purely provisional subject to the confirmation that they satisfy the prescribed eligibility conditions.
- 1.9 Hostel accommodation is not guaranteed. A limited number of hostel accommodations are available which will be allocated on a preferential basis.
- 1.10 Category of Applications:
  - Regular Candidates with Institute fellowship
  - Candidates with Individual Fellowship (CSIR–NET JRF/UGC–NET JRF/ICMR/DST-INSPIRE etc.)

- Candidates from Sponsored Research Project
  - Sponsored Candidates
- 1.11 Maximum Age limit:
- Institute Fellowship Category applicable (as on on the last date of receiving application)
    - For OC Male applicants: 30 years (as on last date of application)
    - For SC/ST/Persons with Disability (PwD) and Female applicants: 35 years (as on last date of application)
    - For OBC (NCL) applicants: 33 years (as on last date of application)
  - Individual Fellowship
    - As per guidelines of funding agency
  - Candidates from Sponsored Research Project
    - As per guidelines of funding agency
  - Sponsored Candidates
    - As per guidelines of sponsoring organization
- 1.12 Reservation for SC/ST/OBC(NCL)/EWS/PwD Categories: The Institute shall follow the reservation policies of the MHRD, Govt. of India. Certificate for EWS/OBC(NCL)/SC/ST/PwD will be as per Govt. of India Rules. For OBC (NCL) category, the format for certificates must be as per DoPTOM No.36036/2/2013-Estt (Res) dated 30.05.2014 and for EWS category, the format for certificates must be as per DoPTOM No.36039/1/2019-Estt (Res) dated 31.01.2019. *OBC (NCL)/EWS certificate must be issued on or after April 1, 2023.*
- 1.13 Students shall be governed by Ph.D. ordinance/ regulations in vogue.
- 1.14 If selected, all the original documents will be verified during physical reporting for admission. If anything found wrong, applicant's admission shall stand canceled.
- 1.15 Selected candidates under Institute fellowship or Individual fellowship category, who are engaged in other Institute/organization as research scholar or other designation, shall be allowed to join in the Ph.D. program after submission of withdrawal order / acceptance of resignation from the institution / organization where they were engaged. The date of beginning of scholarship shall be the date of joining which cannot be earlier than the date of withdrawal order / acceptance of resignation.
2. **Instructions to Fill the Online Application Form**
- Fill up the ONLINE application form with appropriate data with the following:  
  
<https://forms.gle/rLEGVpnHmNm6K2r9>
  - In the online application form: (i) the candidate has to write within 100 words why he/she wants to pursue Ph.D. and why in IEST, Shibpur; (ii) he/she has to write a Statement of Problem (SOP) within 500 words about his/her proposed research work. Please note that you have to upload your digital photograph and signature in image format.
  - Download a pdf copy of PhD admission form from the Institute website ([www.iests.ac.in](http://www.iests.ac.in)) under [PhD admission section](#). Fill up the form and upload a copy of the same while you are submitting the online application. You have to submit the original copy of this application form if selected for admission.
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- Payment of application fee has to be made in the following Institute's Bank account only and upload the scan copy / pdf copy of the receipt while you are submitting online application.

Bank Name: UCO Bank                      Branch name: BESU Branch  
MICR No.: 700028178                      Account Number: 23690110000489  
IFSC Code: UCBA0002369                      Account Type: Savings Account  
Account Name: IEST SHIBPUR- STUDENTS FEE

**Please note that:**

- ❖ Candidates must fill/enter their CGPA or percentage of marks as issued by their institute/college/university. Candidate must not convert their CGPA into percentage and vice-versa.
- ❖ Online application submitted by the candidates shall be considered final and binding. Requests for making correction in the online application shall not be entertained.

Please note that sending of hard copy of the application form is not required.

Additional instructions to the candidates with B. Tech.–M.Tech.

Dual Degree Candidates are advised to fill up the 'Academic Qualification' option in the online application format as

- Graduate degree: Fill up the CGPA / % Marks up to 8th Semester (year of passing: 8th Semester Examination year).
- Post Graduate degree: Fill up the CGPA / % Marks of the 7th to 10th Semester (year of passing: 10th Semester Examination year).

**3. Important Dates<sup>#</sup>:**

| Sl. No. | Event  | Date                                      |
|---------|--|---|
| 1       | Online application starts  | Institute website publication date        |
| 2       | Last date of submission of online application with payment of application fee  | 07.11.2023 (11:59 pm)                     |
| 3       | Publication of shortlist of candidates to be called for written test and or interview/ counseling in the Institute website | To be notified in the institute's website |
| 4       | Date(s) of written test and or interview/ counseling   |   |
| 5       | Publication of final list of selected candidates for Ph.D. admission, December cycle 2023 in the Institute website         |   |
| 6       | Date(s) of admission   |   |

<sup>#</sup>Please visit the Institute website (www.iests.ac.in) regularly for any updates about subsequent amendments in the advertisement and results. No correspondence in any form in this regard will be made by the Institute with an individual candidate.

*The dates given above are tentative. Any changes in the dates will be indicated on the website.*

#### 4. The Institute

Indian Institute of Engineering Science and Technology, Shibpur (IEST, Shibpur) started its journey in 1856 as CALCUTTA CIVIL ENGINEERING COLLEGE and emerged as a premier engineering college in the pre-independence India. It was renamed as BENGAL ENGINEERING COLLEGE, SHIBPUR in 1920. The College received the status of a DEEMED UNIVERSITY in 1993 and was subsequently transformed to BENGAL ENGINEERING AND SCIENCE UNIVERSITY, SHIBPUR in 2004. The institute has been upgraded to an INSTITUTE OF NATIONAL IMPORTANCE by the amendment of NITSER Act of the Parliament in 2014 and renamed as INDIAN INSTITUTE OF ENGINEERING SCIENCE AND TECHNOLOGY, SHIBPUR. The Institute has fifteen departments of Engineering, Architecture, Science, and Humanities & Social Science disciplines. In addition, it has five Schools and two Centres dedicated for imparting education and conducting research in interdisciplinary fields.

##### Why IEST?

- Teaching

One of the remarkable strengths of the Institute is the pool of excellent faculty members. The faculties truly care for their students in clarifying their questions in the class.

- Proximity to Metro City

IEST, Shibpur, is conveniently located and well connected to all important locations in Howrah and Kolkata, the twin cities situated on the two banks of the River Hooghly. It can be easily accessed by train from Shalimar, Howrah, Sealdah and Kolkata Railway Junctions, and is well connected with the NSC Bose International Airport, Kolkata. Of late Kolkata Metro Line 2, a rapid transit line travelling underneath the River Hooghly, has connected the twin cities.

- Research Collaboration with Neighbouring National Institutes

State-of-the-art research facilities of the Institute are helpful to undertake fruitful and relevant research. Further, the proximity to Kolkata allows IEST to collaborate with different top-notch national level neighbouring institutes of the metro like CGCRI, IACS, ISI, IISER and also with renowned universities like University of Calcutta and Jadavpur University.

- NIRF and QS Rankings

In recognition of its core strength in 'Teaching, Learning & Resources', contribution towards 'Research and Professional Practices', inclusive 'Outreach Activity', and 'quality of graduates and post-graduates', the National Institutional Framework (NIRF), Ministry of Higher Education, Govt. of India has awarded the Institute with an All India ranking of 21 in Engineering and 6 in Architecture with an overall ranking of 43. IEST Shibpur has also ranked 301-350 among the top 650 Universities in Asia category by the QS Asia Ranking 2023,

- Availability of Scholarships

This Institute of National Importance (INI) is a Central Govt. Funded Technical Institute (CFTI). This makes different types of funding in the form of scholarships available for the students and faculties.

- Rich Legacy of Illustrious Alumni

The century-old legacy of the Institute has produced illustrious alumni who made remarkable contributions in different fields across the globe. To mention a few, the alumni consists among others Shanti Swarup Bhatnagar laureates like Soumitra Banerjee and Amitabha Bhattacharyya; and Padma Bhusan and Padma Shree recipients like Buddhadev Das Gupta and Chaitanyomoy Ganguli. The strong alumni network takes keen interest in contributing to the development of the Institute.

- Great Campus Life

Physically, IEST Shibpur campus was once a part of the neighbouring AJC Bose Indian Botanic Garden. The flora and fauna of the campus makes it a great place to live. Different student clubs give the student a scope of a quality life outside academics in the campus. The proximity of the metro gives the students the scope of having occasional week-end hangouts at restaurants, multiplexes, theatres, shopping malls etc.

## 5. Ph.D. Programs

The Doctor of Philosophy (Ph.D.) is recommended for those research scholars who are really interested in leadership careers in academia, research institutions, research industries and important decision making bodies of government. After completion of the program, they are expected to be involved in knowledge generation activities.

### 5.1 ELIGIBILITY CRITERIA FOR Ph.D. ADMISSIONS:

The Ph.D. program shall be open to candidates of any Nationality and candidates with the following qualification shall be eligible for admission to the Ph.D. Program of the Institute:

#### 5.2 Essential qualifications for all categories:

Candidates possessing M.Tech. / M.E. / M.Sc.(Engg.) / M.Arch. / M.U.R.P. / M.Plan. / M.T.R.P. / M.Sc. / M.A. or an equivalent postgraduate degree in the relevant branch from a recognized University/Institute shall have minimum 60% marks (or minimum 6.5 CGPA/DGPA on a 10-point scale) throughout from class X to the qualifying degree to apply for admission in the relevant departments. For details of research specialization with allied branches and degrees to be considered, see Section 5.4 of the information brochure.

For SC/ST/ Person with Disability (PwD) category, a minimum 55% marks (or minimum 6.0 CGPA/ DGPA on 10-point scale) throughout from class X to the qualifying degree is required.

*Note: CGPA/ DGPA will not be converted into percentage marks and vice versa.*

#### 5.3 Categories of admission:

##### 5.3.1 Regular Candidates with Institute fellowship:

The maximum age is 30 years as on the last date of receiving application. Relaxation of 5 years is applicable for SC/ST/ Person with Disability (PwD) /Female candidates and 3 years for OBC (NCL) candidates as on the last date of receiving application. Selection shall be based on an initial screening followed by written test and or interview. To be eligible for Institute Fellowship, the candidates must possess a valid GATE (score above the prescribed cut off level)/NET score as applicable for admission to doctoral programmes in various disciplines.

Candidates possessing B.Tech./B.E./B.Sc.(Engg.)/B.Arch./B.Plan. or an equivalent Degree in the relevant branch from a recognized University/Institute with minimum of 80% aggregate marks (8.5 CGPA on a 10point scale) (throughout from class X to the qualifying degree) and a valid GATE score are eligible to apply for admission in the relevant departments/schools/centres.

Candidates, who are already working in a research project in the Institute and satisfying the minimum eligibility criteria as mentioned in Section 5.1 and 5.2, may be allowed to appear in the written test and or interview and if selected, a no objection certificate (NOC) from the Principal Investigator (PI) of the concerned project is needed for availing the institute fellowship and in such cases, he/she will be treated as a regular candidate and has to enroll afresh.

### 5.3.2 Candidates with Individual Fellowship (CSIR–NET JRF/UGC–NET JRF/ICMR/DST-INSPIRE etc.):

Candidates who are qualified for the Individual Fellowship category (i.e. CSIR/ UGC/ ICMR/ DST-Inspire etc.) and who fulfill the minimum eligibility criteria as prescribed in the Section 5.1 and 5.2 are eligible to apply for admission in the relevant Departments/Schools/Centres. They must have a valid offer letter of the fellowship issued by the respective funding agency. They are exempted from appearing in the written test and interview, but they have to appear in the counseling process. Selection will be based on an initial screening followed by counseling process. Note that appearing in the counseling process does not give the guarantee of selection. Candidates admitted under this category will not be entitled to the award of institute fellowship. The maximum age will be considered as per prevailing norms of the respective funding agency.

### 5.3.3 Candidates from Sponsored Research Project:

Candidates who are already working in a research project in the Institute, appointed through the Office of the Dean (R&C) and applying for Ph.D. under Sponsored Research Project category, must fulfill the minimum eligibility criteria as prescribed in the Section 5.1 and 5.2. They have to appear in the counseling process, provided they work in the same sponsored project. If selected, a no objection certificate (NOC) as per supplied format (Form I-D, Annexure IV) from the PI of the concerned project is needed for enrolment in the Ph.D. program. The minimum remaining period of the project as well as tenure of the said project employee should be at least 2 years from the date of interview of the Ph.D. program. The Institute will not provide any assistantship /fellowship to such a research scholars.

### 5.3.4 Sponsored Candidates

Sponsored candidates who are regular faculty/ regular staff members of this Institute or regular faculty members of Govt./Semi Govt. /reputed academic institute or regular employee of reputed industrial or research organization having adequate R&D facilities and who have fulfilled the eligibility criteria as prescribed in the Section 5.1 and 5.2 and have a minimum of two years of professional work experience are eligible to apply for admission to Ph.D. programme in the relevant Departments/Schools/Centres. The Institute shall not provide any assistantship /fellowship to such a research scholar. They have to qualify in the interview process.

*The eligibility criteria of the candidates having only B.Tech. / B.E. degree (for Sponsored category):*

- B.Tech. / B.E. candidate seeking admission to the Ph.D. programme having 02 years of experience in the reputed industry with R&D facility and having at least 80% marks or 8.5 CGPA on the scale of 10 throughout her/his academic career.
- B.Tech. / B.E. candidate having more than 06 years and less than 10 years of experience in the reputed industry with R&D facility and having at least 70% marks or 7.5 CGPA on the scale of 10 throughout her/his academic career.
- B.Tech. / B.E. candidate having 10 years or more experience in the reputed industry with R&D facility should have at least 60% marks or 6.5 CGPA on the scale of 10 throughout her/his academic career.

There are two categories for sponsored candidates:

#### Category A:

*Candidates will have to produce a NOC as per supplied format (Form I-A, Annexure I or for Institute employee: Form I-B, Annexure II) at the time of interview from her/his employer stating clearly that, in the event of her/his being offered an admission, she/he shall be granted a leave of appropriate kind at least for a period of three years to enable her/him to undertake doctoral research at the Institute. The Institute will not provide any assistantship /fellowship to such a research scholars. They have to qualify in the interview process.*



**Category B:**

Notwithstanding anything contained last paragraph above, the Institute may, in its own discretion, permit a candidate belonging to this category to take admission in the PhD programme if she/he is granted a minimum of six months' study leave (*Form I-C, Annexure III*) to enable her/him to complete such part or parts of the course requirement as the SPGC may decide. Under such a case the employer should provide an assurance that necessary permission shall be granted and facilities shall be extended to the candidate to carry out and complete her/his doctoral research at the parent organisation. Under such a case, a co-supervisor from the employing organisation may be assigned. The scholar may be permitted to complete the remaining part of the course requirement by taking such courses as may be permitted by the SPGC.

After necessary coursework requiring regular attendance at the Institute is completed, a scholar admitted under this category may be allowed to work from her/ his parent organisation, i.e. the organisation where he holds a regular substantive appointment.

**5.4 Research Specialization with allied branches and degrees to be considered:**

Research Specialization with allied branches and degrees to be considered in the different Departments/Centres /Schools are listed below:

| Name of the Department / Center / School    | Allied departments/ branches                                       | Degree to be Considered for allied departments/ branches   | Research Specializations   |
|---|--|--|--|
| <b>Departments</b>                          |  |  |  |
| Aerospace Engineering and Applied Mechanics | Civil Engineering/ Mechanical Engineering                          | M.E. / M.Tech. / M.Sc. (Engg.) or an equivalent postgraduate degree  | Fluid Mechanics, Turbulence, Hydromechanics, Hydraulics, Hydraulic Structure, Aerodynamics, Micro-fluidics, Computational Fluid Dynamics, Robotics, Mechatronics, Fluid Power System, CAD/CAM, Computational and Experimental Solid Mechanics, Plasticity, Fracture, Fatigue, Bio-mechanics, Propulsion and Combustion, Thermal and Heat transfer, Earthquake Engineering, Soil Dynamics, Structural Dynamics and Vibration, Aerospace Structure, Nonlinear Dynamics   |
| Architecture, Town and Regional Planning    | Civil Engineering<br>Geography, Economics, Sociology<br>Management | M. Arch. / M. Plan. / M. Des. or an equivalent postgraduate degree<br>M. E. / M. Tech. (in Civil Engineering) or an equivalent post graduate degree<br>M. A./ M.Sc. (in Geography/ Economics/ Sociology) or an equivalent postgraduate degree<br>MBA (in Urban/ Rural Management)/ MBEM (in Building Engineering Management)<br>B. Arch. / B. Plan. / B. E. or | Urban Studies and Housing (Architectural /Urban Conservation, RSand GIS, Tourism Planning, Urban Design, Urban Governance and Management), Urban/ Regional Transportation and Infrastructure Planning, Sustainability and Climate Resilience (Blue Green Infrastructure, Cities and Climate Change, Climate Resilient, Ecosystem Based Services, Urban Design, Urban Heat Island), Disaster Mitigation and Management (Critical Infrastructure Protection - CIP, Rapid Visual Screening), Design (Service Design), Building Sciences & Technologies (Building Information Modelling - BIM, Construction Management, Energy Efficiency, Intelligent and Green Building, Thermal Comfort), History and Theory of Architecture. |

| Name of the Department / Center / School | Allied departments/ branches   | Degree to be Considered for allied departments/ branches   | Research Specializations   |
|--|--|--|--|
|  |  | B. Tech. (in Civil Engineering)  |  |
| Chemistry                                | Physics with Quantum Mechanics and Spectroscopy Specialization   | M.Sc. /M.S.  | Synthetic Organic and Bio-organic Chemistry<br>Supramolecular Chemistry and Molecular Recognition<br>Electrochemistry, Electrocatalysis and Photoelectrochemistry<br>Fluorescence Spectroscopy and Microscopy<br>Theoretical and Computational Chemistry<br>Home- and Heterogeneous catalysis<br>Synthetic Inorganic and Bio-inspired Coordination Chemistry |
| Civil Engineering                        | Environmental Engineering,<br>Geotechnical Engineering,<br>Structural Engineering,<br>Transportation Engineering,<br>Water Resources Engineering,<br>Computational Mechanics, Composite Materials,<br>Aerospace Engineering,<br>Construction Engineering/ Technology,<br>Earthquake Engineering and Structural Dynamics,<br>Environmental Science,<br>Environmental Biotechnology,<br>Geoinformatics,<br>Ocean Engineering,<br>Offshore Engineering<br>Transportation Planning,<br>Urban Planning,<br>Water Resources and Hydraulic Engineering<br>Land and Water Resources Engineering,<br>Water Resources Development,<br>Irrigation Water Management,<br>Surface Water Hydrology,<br>Ground Water Hydrology,<br>Watershed Management,<br>Geospatial Engineering,<br>Geomatics | B.E./ B.Tech./ Equiv. in Civil Engineering &<br>M.E. / M.Tech. / M.Sc.* / M.S./M.Arch. / M.U.R.P. / M.Plan. / M.T.R.P in the allied departments/ branches<br><br>*(Only for admission to Environmental Engineering Specialization) | Environmental Engineering<br>Geotechnical Engineering<br>Structural Engineering<br>Transportation Engineering<br>Water Resources Engineering   |
| Computer Science and                     | Computer Science and Engineering, Information  | M. Tech / M.E.   | Artificial Intelligence and Machine Learning: Data Science, Artificial Intelligence, Machine   |

| Name of the Department / Center / School | Allied departments/ branches  | Degree to be Considered for allied departments/ branches   | Research Specializations  |
|--|---|--|---|
| Technology                               | Technology, Electronics Engineering and Allied Disciplines, Mathematical Sciences |  | <p>Learning, NLP, Social Networks, Bioinformatics</p> <p>Image and Video Processing: Image and Multimedia data Processing, Computer Vision</p> <p>Security and Networking: Network and Cyber security, IoT/Edge computing, 5G/6G cellular network, Cyber Physical Systems, Hardware Security, Wireless communication, Wireless sensor network, Mobile crowd sensing, Vehicular ad hoc network</p> <p>Computer Architecture: High Performance Computing, Embedded Systems, VLSI Design and Test, Modelling and Design with Cellular Automata, Control System Design</p> <p>Algorithms and Applications: Algorithms, Combinatorics, Discrete and Combinatorial Geometry, Digital Geometry</p>   |
| Earth Sciences                           | Geology/ Geography/Earth and atmospheric Sciences/GIS-Remote Sensing              | M.Sc/M.Tech. /Integrated M.Sc. in Geology / Applied Geology / Geosciences/ Geography /GIS-Remote Sensing   | Sedimentation & Basin Tectonics, Sequence stratigraphy, Tectonic Geomorphology, Metamorphic Petrology, Geochronology, Geochemistry, Hydrogeology, GIS & Remote Sensing, Computational Mineralogy  |
| Electrical Engineering                   | Electrical and Electronics Engineering or equivalent                              | M.Tech / M.E in Electrical Engineering with Specialization in Power Electronics, Machines and Drives / Control Systems and Instrumentations / Power and Energy Systems | <p>1. "Soft switching converters and their control; knowledge on embedded controllers and hands on working experience in power electronics and embedded hardware/firmware is desirable; rest depends on the candidate's performance on the day of interview"</p> <p>2. AI assisted Data Driven Approach and Intelligent Systems for Electrical Engineering Applications</p> <p>3. Data-driven control of complex physical systems</p> <p>4. On some aspects of Robust Control with Different Non-linear Systems<br/><i>Or,</i><br/>Discrete-time Fractional Order Control Systems</p> <p>5. Studies on Special electric Machines and their power electronics converters</p> <p>6. High voltage dielectric materials</p> <p>7. Application of Intelligent Control in Robotic systems, Simultaneous localization and Mapping using ROS.</p> <p>8. Magnetostrictive Sensors</p> <p>9. Fundamentals of Power Electronic Systems &amp; Multilevel Converters ,</p> |

| Name of the Department / Center / School      | Allied departments/ branches  | Degree to be Considered for allied departments/ branches | Research Specializations  |
|---|---|--|---|
|   |   |  | SPWM/SVPWM Control, Basic knowledge of digital controllers like FPGA/DSP, Little ideas in PM Machines etc.  |
| Electronics and Telecommunication Engineering | ECE/CS/EE   | M.E. / M.Tech./MS  | Antenna Engineering<br>VLSI Design<br>Opto-electronics<br>Wireless communication and networking<br>Image Processing<br>Electronics Devices and Sensors<br>Microwave Engineering   |
| Humanities and Social Sciences                | English Literature, Comparative Literature, Women's Studies, Cultural Studies, Film Studies   | MA or equivalent   | Campus Literature, American Literature, Indian Writing in English, Partition Literature & Films, Postcolonial Literatures and Theories, Literary Urban Studies, Environmental Humanities, Gender Studies, Translation Studies, Renaissance Literature, Digital Humanities, Cultural Studies, Intersectionality Studies, English language Teaching (ELT)   |
|   |   | M.A./M.Sc. in Economics or Applied Economics Monetary    | Monetary Economics; Macroeconomics; International trade   |
| Information Technology                        | CSE/CST/Computer Science, ETC/ECE/Electronic Science, EE, VLSI Design/Technology, Mathematics | ME, M.Tech., M.Sc.(Engg), M.Sc.                          | Machine Learning and applications<br>Machine Learning for Integrated Sensing and Communication<br>AI-driven Biomedical and Healthcare Systems<br>Internet of Things (IoT)<br>Internet of Medical Things (IoMT)<br>Edge Computing and IoT<br>IoT Communication<br>Cloud computing<br>Intelligent Transportation Systems<br>Future generation traffic analysis<br>Smart Cities<br>5G and beyond<br>Theoretical Computer Science<br>Cellular Automata<br>Democracy and Computation<br>Logic and Automata<br>Artificial Life<br>Information security<br>Multimedia forensics<br>VLSI Design and Test<br>Logic Synthesis<br>VLSI Design for Manufacturability<br>Design for DMFB<br>Image Analysis using Deep Learning techniques<br>Digital Geometric techniques for image processing |

| Name of the Department / Center / School | Allied departments/ branches   | Degree to be Considered for allied departments/ branches                        | Research Specializations   |
|--|--|---|--|
|  |  |   | Medical image analysis   |
| Mathematics                              | Physics<br>Statistics<br>Computer Science<br>Biological Sciences<br>Chemistry  | M.Sc. or Equivalent with at least one Mathematics subject in the master's level | Relativity & Cosmology: i) Astrophysics & Cosmology, ii) Theory of Relativity;<br>Nonlinear Dynamics: i) Mathematical Biology, ii) Mathematical Ecology, iii) Artificial Neural Network<br>Quantum Mechanics: i) Quantum Information Theory, ii) Quantum Communication Theory, iii) Quantum Scattering Theory<br>Functional Analysis: i) Operator Theory, ii) Fixed point Theory, iii) Applied Functional Analysis, iv) Fuzzy Functional Analysis, v) Probabilistic Functional Analysis<br>Matrix Theory<br>Continuum Mechanics: i) Solid Mechanics, ii) Theory of Elasticity, iii) Fluid Mechanics<br>O.R: i) Fuzzy Optimization ii) Supply Chain & Inventory Management<br>Probability: i) Theoretical Probability, ii) Mathematical Theory of Reliability, iii) Inequalities & Theory of Majorization |
| Mechanical Engineering                   | Allied Branches for UG Degree: Production Engg., Power Engineering, Energy Science,<br><br>Allied Branches for PG Degree: Machine Design, Thermal/Fluid Engineering, Production Engg., Manufacturing Sc./Tech., Industrial Engg., Energy Sc., Bio-engineering , Engineering Design | BE/BTech/Equiv<br><br>and<br><br>ME/MTech/Equiv                                 | Thermal & Fluid Sciences, CFD, Combustion Science & Engineering, Biomass & Bio-Energy, Biofuels, Solar Energy, Greenhouse Technology, Fuel Cell Technology, Vibration & Control, Nonlinear Dynamics, Vibration Control, Energy Harvesting, Biomechanics, Biotribology, Fracture Mechanics, Composite Materials, Non-traditional machining, Development of Advanced Materials for cutting tool application, Advanced Materials Processing Technology  |
| Metallurgy and Materials Engineering     | Materials Science and Engineering; Materials/ Mechanical/ Manufacturing/ Aerospace/ Electronic/Ceramic Engineering/Technology; Industrial Engineering; Electrical Engineering; Computer Science and Technology; Information Technology   | M.Tech. / M.E. / M.Sc. (Engg.) or equivalent                                    | Structural Materials<br>Manufacturing Technology<br>Advanced Materials<br>Composites and Nanomaterials<br>Computation Materials Engineering and Machine Learning<br>Surface Engineering<br>Biomaterials  |
|  | Chemistry; Physics   | M.Sc. or equivalent   |  |
| Mining Engineering                       | Occupational Safety & Health, Ergonomics (CHST), Bioengineering,   |   | Safety, Mining and Mining Machinery, Ergonomics, Application to Augment Safety Std, Processing of Mine Waste for Valuables,  |

| Name of the Department / Center / School                      | Allied departments/ branches   | Degree to be Considered for allied departments/ branches            | Research Specializations  |
|---|--|---|---|
|   | Electronics and Telecommunication Engineering, Electrical Engineering, Civil Engineering, Environmental Engineering, Geophysics or equivalent, Civil Engg. Environmental Engg., Metallurgical Engg., Polymer Engg./Science, Environmental Remote Sensing and GIS, Bioengineering                       | M.E. / M.Tech. / M.Sc. (Engg.)/ M.Sc.                               | Extraction of metal values from tailings/ low grade ores, Design and optimization of Mineral Dressing process/equipment, Mining Machinery, Coal Mining, Occupational Safety & Health, Ergonomics. Strata control, IOT in underground coal mines<br>Carbon capture, utilization, and Storage in Geological Media<br>Environmental Pollution Control, Biomining, Coal Quality Upgradation   |
| Physics   | Electronic Science<br>Materials<br>Science/Engineering   | M.Sc/M.Sc (Engg)/ M.Tech  | Quantum Field Theory<br>Condensed Matter Physics<br>Nanomaterials based Sensors<br>Plasma Physics, Photonics, Nuclear Physics   |
| <b>Schools and Centres</b>                                    |  |   |   |
| Centre for Healthcare Science and Technology                  | Aerospace Engineering and Applied Mechanics<br>Computer Science and Information Technology<br>Metallurgy & Materials Engineering<br>IT   | M.E. / M.Tech. / M.Sc. (Engg.) or an equivalent postgraduate degree | Biomedical Engg.<br>Biotechnology<br>Biomaterials/Tissue Engg.<br>Stem cell biology<br>Data analytics   |
|   | Physics, Chemistry   | M.Sc. or equivalent   |   |
| School of Advanced Materials, Green Energy and Sensor Systems | Electrical Engineering / Electronics and Telecommunication Engineering / Power Engineering / Mechanical Engineering / Chemistry / Applied Chemistry with Inorganic / Physical Chemistry specialization / Optics / Optoelectronics / Electronics Device and Circuit / Materials Science and Engineering | M.E. / M.Tech. / M.Sc. or an equivalent                             | Renewable energy integration, Reliability estimation, Electric vehicles, Storage and their management systems, Microgrid, BIPV, Agrovoltatics, Sensors, Advanced materials for clean energy generation and supercapacitive storage, Si & Non-Si hybrid solar cells, Advanced TCO, Nanobiosensors, Semiconductor based advanced optoelectronics devices, Industry compatible solar cell technology such as PERC, TOPCon, HIT, Tandem solar cell, Perovskite material based solar cell, PV Recycling and PV module reliability study. |
| School of VLSI Technology                                     | VLSI Design/Technology, ETC/ECE/Electronic Science/Electronics and Instrumentation, CSE/CST/Computer Science, IT, EE   | ME, M.Tech., M.Sc.(Engg), M.Sc.                                     | Analog-Mixed Signal VLSI Design, Verification and Testing of VLSI Circuits, Logic Synthesis, Semiconductor Devices and Circuits<br>Machine learning based IOT and Hardware security,<br>Emerging Area of VLSI Design (Quantum Circuits, Memristors)<br>Neuromorphic Computing,<br>Embedded System Design,<br>CAD and Design for DMFB,   |

| Name of the Department / Center / School   | Allied departments/ branches   | Degree to be Considered for allied departments/ branches | Research Specializations   |
|--|--|--|--|
|  |  |  | Machine learning based Approximate computing   |
| School of Community Science and Technology | Life Sciences, Microbiology, Food Science and Nutrition, Chemistry, Food Processing, Food Technology, Biotechnology, Chemical Engineering  | M.Sc./M. Tech or equivalent                              | Probiotics, Biofuel from algae, Cereal Processing, Image Processing, Non Destructive methodology |
| School of Mechatronics and Robotics        | Mechatronics, Electronics and Telecommunication Engineering, Mechanical Engineering, Electrical Engineering, Control Systems Engineering, Electrical and Electronics Engineering | M. E. / M. Tech. or equivalent                           | Mechatronics and Robotics  |

## 5.5 Seat Matrix:

The Institute fellowships are available in the following Departments/Centres/Schools:

| Name of the Department / Center / School                      | OC        | EWS      | OBC-NCL   | SC        | ST       | OC-PWD   | EWS-PWD  | OBC-NCL-PWD | SC-PWD   | ST-PWD   | TOTAL      |
|---|-----------|----------|-----------|-----------|----------|----------|----------|-------------|----------|----------|------------|
| Aerospace Engineering and Applied Mechanics                   | 4         | 1        | 3         | 2         | 1        |          |          |             |          |          | 11         |
| Architecture, Town and Regional Planning                      | 2         | 0        | 1         | 1         | 0        |          | 1        |             |          |          | 5          |
| Chemistry   | 2         | 1        | 1         | 1         | 0        |          |          |             |          |          | 5          |
| Civil Engineering   | 4         | 1        | 3         | 2         | 1        |          |          |             |          |          | 11         |
| Computer Science and Technology                               | 3         | 0        | 2         | 1         | 1        |          |          |             |          |          | 7          |
| Earth Sciences  | 1         | 0        | 1         | 1         | 0        |          |          |             |          |          | 3          |
| Electrical Engineering  | 3         | 1        | 3         | 1         | 1        | 1        |          |             |          |          | 10         |
| Electronics and Telecommunication Engineering                 | 3         | 0        | 1         | 1         | 1        |          |          | 1           |          |          | 7          |
| Humanities and Social Sciences                                | 1         | 0        | 1         | 0         | 0        |          |          |             |          |          | 2          |
| Information Technology  | 2         | 1        | 2         | 1         | 0        |          |          |             |          |          | 6          |
| Mathematics   | 2         | 1        | 1         | 1         | 0        |          |          |             |          |          | 5          |
| Mechanical Engineering  | 2         | 1        | 2         | 1         | 1        | 1        |          |             |          |          | 8          |
| Metallurgy and Materials Engineering                          | 2         | 1        | 2         | 1         | 0        |          |          |             |          |          | 6          |
| Mining Engineering  | 1         | 0        | 1         | 0         | 0        |          |          |             | 1        |          | 3          |
| Physics   | 2         | 1        | 1         | 1         | 1        |          |          |             |          |          | 6          |
| Centre for Healthcare Science and Technology                  | 1         | 0        | 0         | 0         | 0        |          |          |             |          |          | 1          |
| School of Advanced Materials, Green Energy and Sensor Systems | 1         | 0        | 0         | 0         | 0        |          |          |             |          |          | 1          |
| School of VLSI Technology                                     | 1         | 0        | 0         | 0         | 0        |          |          |             |          |          | 1          |
| School of Community Science & Technology                      | 1         | 0        | 0         | 0         | 0        |          |          |             |          |          | 1          |
| School of Mechatronics & Robotics                             | 1         | 0        | 0         | 0         | 0        |          |          |             |          |          | 1          |
| <b>Total</b>  | <b>39</b> | <b>9</b> | <b>25</b> | <b>15</b> | <b>7</b> | <b>2</b> | <b>1</b> | <b>1</b>    | <b>1</b> | <b>0</b> | <b>100</b> |

*Note: In absence of any applicant from PwD category, the seat reserved for PwD category will be filled by the candidate(s) who belong to the same category (without PwD).*

## 5.6 Fees and other details for the Ph.D. program

Every Research Scholar shall be required to pay the following fees at the time of joining. All Fees may be revised as per the decisions of the Institute authority. The candidates will be notified about such revisions through the Institute website.



| Sl. No. | Item  | Amount per semester (Rs.) <sup>#</sup> |
|---------|---|--|
| 1.      | Enrolment Fee (One time and non-refundable)       | 3,000                                  |
| 2.      | Research scholar Activity Fee                     | 500                                    |
| 3.      | Infrastructure Maintenance Fee                    | 2,500                                  |
| 4.      | Examination Fee (One time and non-refundable)     | 1,000                                  |
| 5.      | Tuition Fee                                       | 7,500                                  |
| 6.      | Institute Caution Money (One time and refundable) | 3,000                                  |
| Total   |   | 17,500.00 <sup>#</sup>                 |

*<sup>#</sup>In addition to above an amount equals to the yearly premium for enrolling in compulsory medical insurance scheme of the students shall have to be paid. The exact amount of yearly insurance premium shall be intimated at the time of admission.*

Semester registration is must for all categories of research scholar as per academic calendar of the Institute. Defaulters with pending dues are not allowed to pursue further academic activities of the Institute. In future, the payment method may change.

### 5.7 Compliance to Institute Rules

Students shall be governed by the Ordinances for postgraduate programmes of the Institute in vogue.

All students are bound by the Institute Rules and must comply by such orders as may be issued from time to time by the appropriate authority. Serious breach of Institute Rules may entail removal from the Institute. For vacations and holidays, the academic calendar notified at the beginning of each semester shall be followed.

## 6. The Institute Campus and Other Facilities

The Institute has a beautiful green campus covering an area of about 49hectares situated on the bank of the river Hooghly. It is located next to the AJC Bose Indian Botanical Garden and opposite to the Kolkata Port. The campus has a number of academic and administrative buildings, library, accommodations for staffs and students, guest house, auditorium, swimming pool, students' amenities, banks, school, hospitals and general services.



Main Academic and Acharya SN Bose Building

The four-storied Main Academic Building accommodates most of the engineering departments, Department of Human Resources Management, Office of the Dean (Academics) and Office of the Deputy Registrar (Academics). The eight-storied Acharya S N Bose Building accommodates science departments, architecture, and various centers and schools. SOCSAT is located inside a heritage building. Offices of the Director, Deans, Registrar, and other administrative offices are also located in the eight-storied building.



Main Academic Building

## 6.1 Central Facilities

### 6.1.1 Library

The Institute has a separate library building which is kept open from 9 AM to midnight. The library provides online search facilities (OPAC) of its database from any computer connected to the Internet and also from the computers in the library dedicated for the users. Currently, the library has more than 1.4 lakhs text and reference books, and 40,000 bound volumes of journals. It also has a huge collection of documents including patents, standards, technical reports and pamphlets. The library possesses a good collection of old and rare books and journals of the nineteenth century. The library is a member of the Indian National Digital Library in Engineering Science and Technology (INDEST) and UGC-INFONET Digital Library Consortium of Information and Library Network (INFLIBNET) Centre and provides online access to full text

of journals including American Society of Civil Engineers (ASCE), American Society of Mechanical Engineers (ASME), Economic and Political Weekly, IEEE /IIEE Electronic Library (IEL Online), ISID, JCCC@INFLIBNET, JSTOR, Science Direct, Springer Link and many others. It subscribes a large volume of e-books. The library also has different software which helps the students to write papers and reports in correct English with the plagiarism checking.



Ramanujan Library

### 6.1.2. Computer Centre

All departments, schools and centres of the Institute have computing facilities for their students. In addition, there is a Central Computer Centre which provides computing facilities for undergraduate and post-graduate courses and research works. The Computer Centre along with the departments, schools, centers, offices and hostels are connected to a campus wide fibre optic network. The entire campus including the hostels is Wi-Fi enabled.

### 6.1.3. Workshop

The Workshop Complex has nine engineering workshops including Carpentry, Smithy, Welding and Painting, Fitting, Machine, Foundry and Pattern, Boiler, Electric, Automobile, and Project Model to offer workshop practice.



## 6.2 Health Service

The Institute has a Health Unit with Medical Officers and other supporting staff to serve the Primary medical needs of the campus inmates. It provides 24hours' ambulance service. The Unit has an ID Ward to effectively isolate students suffering from infectious diseases. However, for serious cases the patients are referred to suitable city hospital.

## 6.3 Hostel Accommodation

Hostel accommodation is not guaranteed. It may be provided as per norms of the institute, subject to availability.

## 6.4 6.4 Students Amenities

Office of the Dean of Students Welfare facilitates all students to use different facilities available at the campus. The students of this Institute are encouraged to participate in sports and games, various cultural activities like music, photography, dramatics, paintings, model making, creative writing, debating, as well as to explore innovation and incubation of business plans, etc. All students are encouraged to participate in games or some form of physical training. The students are advised to join the athletics Club and at least one of the societies in the Students' Activity Centre. The campus has the following amenities for the students.

- Centre for Creative Expressions with different hobby clubs
- R. N. Banerjee Student Recreation Centre
- Institute Hall: A Multipurpose Auditorium
- Gymnasium
- Oval and Lords - Two sports grounds
- Swimming Pool
- Alpona Banerjee Memorial Centre for Innovation
- Basketball court
- Student canteens /cafeteria as well as food kiosks
- Tagore Green Business Incubation Centre.

**FORM I-A**  
**No Objection Certificate for Admission into Ph.D. Program**  
**(Sponsored Candidates: Category A)**  
(Should be typed on the letter head of the sponsoring organization)

Reference No.

Date:

To  
The Dean, Academic  
Indian Institute of Engineering Science and Technology, Shibpur  
Howrah 711103

**Sub: Sponsoring an Employee for Ph.D. Program**

Dear Sir,

We hereby sponsor the candidature of Mr./Ms./Mrs. -----, Designation: -----  
----- who is a regular employee in our organization, for joining Ph.D. Program in the  
Department of ----- at your Institute as a full-time student.

It is certified that he/she has completed two years of service in our organization as a regular employee.  
He/she has gained experience in the field(s) -----.

If selected, we shall relieve him/her from his/her duties to join the program during the first three years of  
the Ph.D. Program.

**Signature and Seal of the Sponsoring Authority**

**FORM I-B**  
**No Objection Certificate for Admission into Ph.D. Program (Institute Employee)**

Reference No.

Date:

It is certified that we have no objection if Mr./Mrs/Ms. -----,  
Designation: -----, a regular employee/staff member of this Institute, working  
in the department of -----, is applied for admission into the Ph.D. Program in the  
department of ----- at this Institute.

If selected, he/she shall be allowed to attend classes/research work without affecting normal duties assigned to him/her.

**Signature of Head of the Department**

**Signature of Registrar**

**FORM I-C**  
**No Objection Certificate for Admission into Ph.D. Program**  
**(Sponsored Candidates: Category B)**  
(Should be typed on the letter head of the sponsoring organization)

Reference No.

Date:

To  
The Dean, Academic  
Indian Institute of Engineering Science and Technology, Shibpur  
Howrah 711103

**Sub: Sponsoring an Employee for Ph.D. Program**

Dear Sir,

We hereby sponsor the candidature of Mr./Ms./Mrs. -----, Designation: -----  
----- who is a regular employee in our organization, for joining Ph.D. Program in the  
Department of ----- at your Institute as a full-time student.

It is certified that he/she has completed two years of service in our organization as a regular employee.  
He/she has gained experience in the field(s) -----.

If selected, we shall relieve him/her from his/her duties to join the program during the first six month of the  
Ph.D. Program to complete the PhD course work. We also providing an assurance that necessary permission  
shall be granted and research facilities shall be extended to the candidate to carry out and complete her/his  
doctoral research from our organisation. In addition to this a co-supervisor from our organisation also may  
be assigned to him.

**Signature and Seal of the Sponsoring Authority**

**FORM I-D**  
**No Objection Certificate for Admission into Ph.D. Program**  
**(Sponsored Research Project candidates)**

Reference No.

Date:

To  
The Dean, Academic  
Indian Institute of Engineering Science and Technology, Shibpur  
Howrah 711103

**Sub: No objection Certificate**

Dear Sir,

We have no objection if Mr./Mrs/Ms. -----, a research scholar/ Project fellow working under the project: -----(title of the project), project code----- (DRC project code) funded by ----- (name of the funding agency), Sanction letter no. -----, in the Department/School/Centre of -----, is admitted to the Ph.D. Program of the Institute.

It is certified that the minimum remaining period of the sponsored project as well as total tenure of appointment of the said project employee must not be less than two years from the date of joining the PhD programme.

If selected, we shall allow him/her to attend classes/research work during the Ph.D. program without affecting normal project work assigned to him/her.

**Signature of Project Investigator**  
**(Name)**

**Signature of Dean (R & C)**

***For any specific inquiry regarding Ph.D. admission December cycle2023, please mail us at [phd\\_admission@iests.ac.in](mailto:phd_admission@iests.ac.in)***

Professor Binay Krishna Ghorai, Professor In-Charge of Admission, IEST, Shibpur

Dr. Asok Adak, Associate Dean, Academic, IEST Shibpur

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