INFORMATION BROCHURE FOR INSTITUTE POST-DOCTORAL FELLOWSHIP (IPDF) & INSTITUTE Ph.D. RESEARCH SCHOLAR SCHEME (IPRSS)

ACADEMIC YEAR 2026-27

1. INTRODUCTION

Shri Guru Gobind Singhji (SGGS) Institute of Engineering and Technology, Vishnupuri, Nanded, stands as a premier autonomous center of excellence in technical education. Our core objective is to consolidate our position as a leader in engineering research in India by fostering an ecosystem of innovation and scholarly rigor.

To catalyze this vision, the office of Dean (R&D) has implemented a comprehensive research strategy focused on:

- **Attracting Talent:** Identifying and motivating young, talented researchers with the intellectual potential to conduct meaningful research recognized by global peers.
- **World-Class Environment:** Providing a research infrastructure at par with the IITs, backed by dedicated funding and administrative support, enabling researchers to realize their peak potential.
- **Knowledge Dissemination:** Ensuring that research outcomes at SGGSIET are effectively communicated through high-impact publications and widely disseminated across global scientific communities.
- **Global Collaborations:** Establishing strategic institutional partnerships and joint research programs with leading universities and industries within India and abroad.

2. THE SCHEMES

In alignment with these goals, SGGSIET has pioneered the Institute Ph.D. Research Scholar Scheme (IPRSS) since 2017 and is now strengthening its research tier with the Institute Post-Doctoral Fellowship (IPDF). These schemes are designed for enthusiastic scholars who seek to contribute significantly to value addition in Engineering and Technology.

We invite applications from eligible and motivated candidates for admission to the IPDF and IPRSS programs for the Academic Year 2026-27.

3. ELIGIBILITY

3.1. Institute Ph.D. Research Scholar Scheme (IPRSS)

A. Minimum Educational Qualifications:

- **Master's Degree:** M.E. / M.Tech. or equivalent in the relevant area of research.
- **Bachelor's Degree:** B.E. / B.Tech. in an appropriate branch or equivalent.
- **Academic Standing:** Candidates must possess a **First Class** or equivalent Grade Point at both Bachelor's and Master's levels.

B. Essential Entrance Criteria:

Candidates must satisfy at least one of the following:

- A valid **PET Score** from Swami Ramanand Teerth Marathwada University (SRTMUN), Nanded.
  OR
  a valid **GATE Score**.

C. Professional Experience:

- Candidates with a minimum of **two years of industry or professional experience**, in addition to the qualifications mentioned in 'A' and 'B' above, will also be considered.

3.2. Institute Post-Doctoral Fellowship (IPDF)

A. Eligibility Criteria:

- **Academic Record:** The candidate must hold a **Ph.D. degree** awarded within the **last five years** from a recognized Institute or University.
- **Full-Time Commitment:** This scheme is strictly for **Full-time** Post-Doctoral Research Fellows.
- **Exclusivity:** Candidates currently receiving financial support (salary, scholarship, or stipend) from any external source are **not eligible**.
- **Ineligible Categories:** Sponsored or part-time candidates will not be considered for this fellowship.

4. FINANCIAL SUPPORT

A. FINANCIAL ASSISTANCE FOR IPRSS

Full-time research scholars selected under the Institute Ph.D. Research Scholar Scheme (IPRSS) will receive financial assistance in the form of a monthly stipend as follows:

Period of Research	Monthly Stipend
First Year & Second Year	₹35,000/- per month
Third Year (SRF Level)	₹38,000/- per month

- Important Conditions for Stipend:

1. Performance Review: The enhancement of the stipend from ₹35,000 to ₹38,000 in the third year is subject to the successful completion of Ph.D. Course Work and a satisfactory "Progress Seminar" report by the Doctorate Research Committee (DRC).

2. Exclusivity: Scholars receiving this stipend are not permitted to receive any other financial assistance, salary, or scholarship from any other source.
3. Contingency: The institute may provide a separate annual contingency grant (as per existing SGGSIET norms) for research-related expenses like consumables and conference registrations.

B. FELLOWSHIP For (IPDF)

Selected candidates for the Institute Post-Doctoral Fellowship (IPDF) will be provided with a handsome consolidated fellowship from the Institute Fund as follows:

- First Year: ₹70,000/- per month (Consolidated).
- Second Year: ₹80,000/- per month (Consolidated).
- Total Duration: The fellowship is initially for a period of two years.
- Performance-based Extension: An optional extension of one additional year may be granted subject to an outstanding performance review and approval by the Institute's review committee.

5. ROLES, RESPONSIBILITIES, AND CONDITIONS

5.1. Institute Ph.D. Research Scholar Scheme (IPRSS)(Ph.D.)

Scholars admitted under the Institute Ph.D. Research Scholar Scheme (IPRSS) are expected to contribute to the academic and research excellence of SGGSIE&T through the following mandates:

5.1.1. Academic Contribution

- Scholars must handle a mandatory teaching load of 16 hours per week, which includes classroom instruction, laboratory supervision, and tutorial sessions as assigned by the Head of Department.

5.1.2. Research Focus and Societal Impact

- SGGSIE&T prioritizes research that translates into real-world applications. The candidate must explicitly work towards solving complex problems faced by industry or society as the core objective of their Ph.D. work.
- Research topics that demonstrate direct industrial utility or address critical social challenges will be prioritized during the selection and review process.

5.1.3. Renewal of Assistantship

The continuation and annual renewal of the IPRSS stipend are strictly contingent upon:

- Enrolment: Maintaining active and valid registration in the Ph.D. program.

- Research Progress: Demonstrating satisfactory progress in research work as verified by the Doctorate Research Committee (DRC).
- Administrative Performance: Maintaining a high standard of performance in the discharge of responsibilities as a teaching/research assistant during the preceding semester.

5.1.4. Mandatory Three-Year Commitment & Refund Clause

- Full-Term Commitment: The IPRSS is a high-investment scheme by the Institute. Any scholar wishing to terminate their position as a full-time IPRSS scholar before the completion of three years from the date of joining will be subject to a strict recovery policy.
- Refund of Stipend: In the event of early termination, the scholar will be required to return the entire stipend amount received from the Institute in one single instalment.

5.2. Institute Post-Doctoral Fellow (IPDF)

5.2.1. Primary Academic and Research Duties

The Post-Doctoral Fellow is required to engage in full-time research work under the guidance of an assigned Faculty Supervisor at SGGSIE&T. In addition to their core research, every fellow shall devote 16 hours per week to the following institutional responsibilities:

- Teaching & Academics: Handling assigned teaching loads, including conducting Theory, tutorials and laboratory sessions for UG/PG students.
- Research Infrastructure: Assisting in laboratory development, maintenance of equipment, and providing support for central facilities and the library.
- Administrative R&D Support: Actively participating in research assistance, R&D project management, and drafting of new research proposals for external funding agencies.

5.2.2. Evaluation and Fellowship Continuation

The continuation of the fellowship is strictly performance-linked and requires:

- Quarterly Review: A comprehensive evaluation of performance every three months.
- Documentation: Regular submission of detailed research progress reports.
- Compliance: Satisfactory completion of all assigned academic and administrative duties.
- Approvals: Certification of performance by the Supervisor and Head of Department (HoD), with final approval by the Director, SGGSIE&T.

5.2.3. Expected Research Output

To maintain the high standards of SGGSIE&T, every IPDF is expected to achieve the following milestones annually:

- Publications: At least one SCI/Scopus indexed publication per year.
- Knowledge Sharing: Participation and presentations in reputed National/International conferences.
- Innovation: Focus on Patent filing or Prototype development.
- Grant Writing: Substantial contribution to the development of externally funded R&D proposals.

Leave Entitlement and Conduct

- Casual Leave: Fellows are entitled to 8 days of casual leave per academic year.
- Termination Clause: The fellowship may be terminated due to misconduct, violation of Institute norms, unsatisfactory performance, or unapproved discontinuation.
- Recovery Clause: A fellow leaving the program mid-way may be required to refund the fellowship paid during that specific semester.

6. AREAS OF SPECIALIZATION

6.1. Area of specialization for IPRSS

The institute invites applications across the following departments and broad research areas. Priority will be given to projects that demonstrate direct application to Industry 4.0, Sustainable Development, and Societal Welfare.

Sr. No	Department	Broad Areas of Specialization (Indicative)
1	Civil Engineering	Water Resources Systems, Environmental Engineering, Remote Sensing and GIS Application for Water Resource Management, Structures, Geotechnical Engineering.
2	Computer Science & Engineering	Pattern Classification & Image Processing, Wireless, Fuzzy & Neural Networks, Data Mining, Machine Learning, Data Analytics, Human-Computer Interaction, Information Security, Programming Languages
3	Electronics & Telecommunication	Digital Signal and Image Processing, Pattern Recognition and Computer Vision, Biomedical Engineering, Non-Conventional Energy Sources, Telecommunication, Wireless Communication, 6G Wireless Communication
4	Information Technology	Image Processing & Computer Vision, Wireless Communication and Computing, Vehicular Adhoc Network, Information & Network Security, Blockchain Technology, AI and Smart Systems, Machine Learning, Deep Learning.
5	Production Engineering	Analysis of Self-healing Composites, Sheet Metal Forming, Micro & Non-traditional Manufacturing, Quality and Reliability Engineering, CAD/CAM Customization, Solar Energy for Agriculture, Composite materials, Thermal Engineering

6	Instrumentation Engineering	Advanced Process Control, Intelligent Control, Biomedical Instrumentation, Agricultural Instrumentation, Large Scale Systems, Digital Signal and Image Processing, Smart Sensors and IoT
7	Textile Technology	Weaving, Knitting, Non-Woven Technology, Productivity Enhancement, Garment Technology, Technical Textiles, Antibacterial and Smart Textile Materials, Fibre Reinforced Composite, Textile Testing, Functional and High-Performance Textiles, Man Made fibres.
8	Mechanical Engineering	Renewable Energy and Energy Storage Systems, Thermal management, Computational Mechanics, Passive Flow Control, Passive Cooling Techniques, Cryogenics, Material Characterization

6.2. Area of specialization for IPDF

6.2.1. Electronics & Telecommunication Engineering

- **6G Wireless Communications:** Focus on Terahertz (THz) communication and Reconfigurable Intelligent Surfaces (RIS).
- **Edge AI & TinyML:** Developing low-power AI algorithms that run directly on hardware/sensors rather than the cloud.
- **Quantum Communication & Cryptography:** Secure data transmission using quantum key distribution (QKD).
- **Flexible & Wearable Electronics:** For real-time health monitoring and IoT integration.

6.2.2. Computer Science & Information Technology

- **Generative AI & LLM Optimization:** Domain-specific Large Language Models (e.g., AI for Indian Legal or Medical systems).
- **Explainable AI (XAI):** Making "Black Box" AI decisions transparent, especially for healthcare and defense.
- **Blockchain for Secure Supply Chains:** Beyond crypto—focusing on food traceability and secure electronic health records.
- **Cyber-Physical Systems (CPS) Security:** Protecting critical infrastructure (power grids, water systems) from sophisticated cyber-attacks.

6.2.3. Civil Engineering

- **Smart & Self-Healing Infrastructure:** Using bio-concrete or shape-memory alloys that fix cracks automatically.
- **Digital Twins for Urban Planning:** Creating 3D virtual models of cities for real-time traffic, flood, and disaster management.
- **Carbon-Negative Construction:** Research into Geopolymer concrete and carbon sequestration in building materials.

- **3D Concrete Printing:** Optimized structural designs for rapid, low-cost housing.

6.2.4. Production / Mechanical Engineering

- **Additive Manufacturing (4D Printing):** Materials that change shape or properties over time in response to external stimuli.
- **Green Hydrogen Production & Storage:** Designing efficient electrolyzers and solid-state hydrogen storage systems.
- **Digital Thread in Industry 5.0:** Focusing on Human-Robot Collaboration (Cobots) on the shop floor.
- **Circular Economy & E-Waste Recycling:** Advanced automated disassembly and recovery of precious metals from electronic waste.
- **Energy Storage Systems:** Designing efficient energy storage systems, Thermal management
- **Renewable Energy:** Numerical Simulation on wind turbine, hydro turbine, Solar PV/T applications

6.2.5. Instrumentation / Electrical Engineering

- **Smart Grid & V2G (Vehicle-to-Grid):** Bidirectional charging systems where EVs act as mobile batteries for the grid.
- **Non-Invasive Biomedical Instrumentation:** Sensors using light (Photonic) or RF to measure blood glucose and other vitals without needles.
- **Autonomous Vehicle Control Systems:** Sensor fusion (LiDAR, Radar, Vision) for navigation in unstructured Indian traffic environments.
- **Energy-Efficient Power Converters:** Using Wide Bandgap (WBG) semiconductors like GaN and SiC for high-efficiency power electronics.
- **Micro-Electro-Mechanical-Systems (MEMS):** Design of MEMS-based Sensors and Actuators
- **Artificial Intelligence in Automation:** AI in automation for enhanced diagnostic capability and predictive maintenance
- **Biomedical Instrumentation:** Wearable health monitoring sensors, non-contact heart rate detection
- **Data Fusion:** Combining data from multiple sensors to create more robust instrumentation systems

6.2.6. Textile Technology

- **Technical & Medical Textiles (Meditech):** Antimicrobial, biodegradable, and structurally engineered textile scaffolds for healthcare, tissue engineering, and wound management.

- **Functional & Smart Textiles:** Sensor integrated and multifunctional fabrics for physiological monitoring, environmental sensing, and wearable applications.
- **Smart Textiles with Energy Harvesting:** Textile based triboelectric and piezoelectric systems for self powered wearable and low energy electronic devices.
- **Advanced Weaving & Knitting Technologies:** High performance 2D, 3D, and multi axial textile architectures optimized for load bearing and functional applications.
- **Textile Reinforced Composite Materials:** Woven and knitted textile reinforcements for lightweight, durable, and sustainable composite structures.
- **Man Made Fibres & Sustainable Textiles:** Chemical recycling and functional modification of synthetic fibres for circular, high value textile applications.
- **Textile Testing & Performance Evaluation:** Advanced mechanical, thermal, electrical, comfort, and durability assessment of technical and smart textile products.
- **Geotextile:** Geotextiles for soil reinforcement, drainage, erosion control, and infrastructure applications

6.3. Multidisciplinary Research (MDR)

Multidisciplinary research at the Post-Doctoral level is an strategic necessity for SGGSIET to transition from traditional academic silos toward a high-impact "Lab-to-Market" ecosystem. By integrating diverse domains such as AI-driven precision agriculture, smart textile-based healthcare, and sustainable civil infrastructure—the institute can solve complex, real-world problems that a single discipline cannot address alone. This approach significantly boosts institutional prestige by increasing high-value patent filings and citations in cross-functional journals, directly elevating NIRF and NAAC rankings. Furthermore, it prepares PDF scholars to lead future R&D initiatives by providing them with the "System-level" expertise required by modern industry, ultimately ensuring that the Institute's internal funding yields a substantial return through innovative, socially relevant technology and a globally competitive research profile.

6.3.1. Smart Agriculture & Precision Farming (The "Agri-Tech" Cluster)

- **Departments involved:** *Instrumentation, CS/IT, Production, and Electronics and Telecommunication.*
- **Research Focus:** Using Agricultural Instrumentation (sensors) and Drones (Electronics) to collect soil/crop data, which is then processed using AI/Machine Learning (CS/IT) to optimize irrigation and fertilizer use. Production Engineering can contribute through the design of specialized solar-powered automated farm machinery.
- **Societal Impact:** Direct benefit to the farmers in the Marathwada region.

6.3.2. Digital Healthcare & MedTech (The "Bio-Engineering" Cluster)

- **Departments involved:** *Electronics and Telecommunication, Instrumentation, CS/IT, and Textile Technology.*

- **Research Focus:** Developing Non-Invasive Biomedical Sensors (Instrumentation) integrated into Smart Textiles (Textiles) for continuous health monitoring. The huge data generated is analyzed via Edge AI (CS/IT) for early disease detection.
- **Innovation:** "Wearable Clinics" that monitor vitals without bulky machines.

6.3.3. Sustainable Infrastructure & Disaster Management (The "Smart City" Cluster)

- **Departments involved:** *Civil Engineering, CS/IT, and Electronics and Telecommunication.*
- **Research Focus:** Integrating IoT Sensors (Electronics) into Self-healing Concrete Structures (Civil). This data is used to create Digital Twins (CS/IT) of bridges or dams to predict structural failures or manage water resources in real-time using GIS/Remote Sensing.
- **Societal Impact:** Enhancing the safety and longevity of public infrastructure.

6.3.4. Industry 5.0 & Green Manufacturing (The "Circular Economy" Cluster)

- **Departments involved:** *Production/Mechanical, Electrical/Instrumentation, and IT.*
- **Research Focus:** Implementing Human-Robot Collaboration (Production) in manufacturing plants where Control Systems (Instrumentation) and Blockchain (IT) ensure secure and energy-efficient operations. Focus on E-waste Recycling using automated disassembly systems.
- **Innovation:** Zero-waste, highly customized production lines.

6.3.5. Smart Energy Systems & EV Technology (The "E-Mobility" Cluster)

- **Departments involved:** *Electrical/ Electronics and Telecommunication, Production, and CS/IT.*
- **Research Focus:** Designing High-Efficiency Power Converters (Electrical) for Electric Vehicles, using Additively Manufactured (Production) lightweight heat sinks, and managing battery life through AI-driven Battery Management Systems (BMS) (CS/IT).
- **Innovation:** Next-generation fast-charging solutions and V2G (Vehicle-to-Grid) integration.

6.3.6. AI/ML Applications in Smart Manufacturing & Mechanical Systems (The “Intelligent Manufacturing” Cluster)

- **Departments involved:** *Mechanical Engineering, Production Engineering, Computer Science/IT, and Electronics & Telecommunication Engineering.*
- **Research Focus:** Development of AI/ML-based predictive and preventive maintenance systems for industrial machinery using sensor data, vibration analysis, thermal imaging, and IoT-enabled monitoring. The cluster will also focus on intelligent fault diagnosis,

digital twins for manufacturing systems, AI-driven quality inspection, energy-efficient manufacturing processes, and optimization of machining and production parameters through data analytics.

- **Innovation:** Smart factories with real-time machine health monitoring, autonomous maintenance scheduling, AI-assisted root cause analysis, and Industry 4.0-based intelligent manufacturing systems for improving productivity, reliability, and operational efficiency.

7. SELECTION PROCEDURE AND ADMISSIONS: IPRSS

The admission to the **Institute Ph.D. Research Scholar Scheme (IPRSS)** for the academic year 2026-27 shall follow a structured two-stage process to ensure academic excellence and research potential:

7.1. Shortlisting of Candidates:

- Initial screening will be based on the **Minimum Educational Qualifications** (First Class in B.E./B.Tech and M.E./M.Tech).
- Candidates must possess a valid **SRTMU Nanded PET Score** or a valid **GATE Score**.
- Applications will be categorized based on the **Maharashtra State Reservation Policy** (SC/ST/OBC/VJNT/EWS/Open)

7.2. Research Presentation and Interview:

- Shortlisted candidates will be invited for an interview before a duly constituted Selection Committee, chaired by the Director and featuring subject experts and a Backward Class (BC) representative, Dean R&D.
- Candidates are required to give a brief presentation (5–10 minutes) on their proposed research area, specifically highlighting how their work will solve industrial or societal problems.
- **Evaluation Criteria:** Candidates will be assessed on:
    1. Domain Knowledge and Academic Record.
    2. Research Aptitude and Problem-Solving Approach.
    3. Potential for High-Impact Publications and Patents.
    4. Consistency with the Department's Thrust Areas.

7.3. Final Merit List and Admission:

- A consolidated merit list will be prepared based on the performance in the interview and academic credentials.

- The final selection is subject to the verification of original documents, including Domicile, Caste Certificate, Caste Validity, and Non-Creamy Layer (NCL) certificates where applicable.
- Selected scholars must complete the formal Ph.D. admission and registration process of **SRTMU Nanded** through the SGGSIET research center.

8. SELECTION RULES FOR INSTITUTE POST-DOCTORAL FELLOWSHIP (IPDF)

8.1. Academic Eligibility:

- The candidate must hold a **Ph.D. degree** in the relevant Engineering discipline awarded within the **last five years** from a recognized Institute or University.
- **Provisional Eligibility:** Candidates who have submitted their Ph.D. thesis and completed the Viva-Voce are eligible to apply, provided they produce the provisional degree certificate at the time of joining.

8.2. Research Excellence (Minimum Threshold):

- Candidates must have a minimum of **two (02) publications in SCI/Scopus indexed journals** of high repute, along with presentations in reputed international conferences.
- Preference will be given to candidates with high **h-index** or those who have filed/granted **Patents**.

8.3. Nature of Fellowship:

- This is a strictly **Full-time** residency program. Sponsored, part-time, or "on-leave" candidates from other organizations are not eligible.
- **Exclusivity:** Candidates receiving any financial support (salary, scholarship, or stipend) from any external source (DST, CSIR, SERB, or Private Industry) are not eligible.

8.4. Age Limit (Recommended Rule):

- The upper age limit should be **35 years** (as of the last date of application). A relaxation of **5 years** is applicable for SC/ST/OBC/Women/PwD candidates.

8.5. Selection Mechanism (Multidisciplinary Focus):

- Selection will be based on a Research Proposal (SOP) submitted by the candidate and a technical interview/presentation before the Selection Committee.
- Candidates proposing multidisciplinary research across two or more departments of SGGSIET will be given additional weightage in the merit list.

8.6. Cooling-off Period (Recommended Rule):

- To ensure fresh perspectives, a Ph.D. graduate from SGGSIET Nanded itself may be eligible only if they have spent at least one year in another reputed research lab/industry after their Ph.D. (This prevents "in-breeding" of research and encourages external talent).

8.7. Final Approval

- **Merit List:** Merit list will be prepared on the basis academic performance , proposal and interview.

- **Reservation Norms:** The selection will adhere to the Maharashtra State Reservation Policy.

- **Approval:** The final list will be submitted by the Committee for the **Director's Approval**, followed by the issuance of the Offer Letter.

9. FEES AND DEPOSITS

- As per SGGS and SRTMU Nanded norms.

Director
Shri Guru Gobind Singhji Institute of Engineering and Technology,
Vishnupuri, Nanded-431606 (Maharashtra)