# INDIAN INSTITUTE OF TECHNOLOGY DELHI
# HAUZ KHAS, NEW DELHI-110016

ADVERTISEMENT NO. IITD/2021/PDF-2

## ADVERTISEMENT FOR THE POSITION OF POST DOCTORAL FELLOW

IIT Delhi invites applications from qualified persons for the position of **Post-Doctoral Fellow (PDF)** in its various academic units to further promote inter-disciplinary research activities, strengthen research culture, enhance research output of the Institute and groom potential faculty.

### Who can apply?

- Indian Nationals of General/SC/ST/OBC-NCL/EWS category as well as with physical disability

### Age Limit:

- Maximum age of candidate is 32 years (for male) and 35 years (for female). Age relaxation for reserved candidates as per Govt. of India guidelines.

### Minimum Eligibility Criteria:

- Ph.D. with First class or equivalent grade in preceding degree with consistently good academic record
- Minimum two referred publications in Journals/Conferences out of which at least one should be in a reputed journal

### Remuneration & Benefit:

- Fellowship of Rs. 75,000/- per month plus House Rent Allowance (HRA) at the Govt. of India rate for New Delhi. No Institute accommodation will be provided.
- Professional Development Allowance (PDA) of Rs. 1.00 lakh per financial year (April-March) available from the date of joining the institute. PDA is apportioned @ Rs. 25,000/- for every quarter from the date of joining. Unutilized PDA can be carried forward to the next financial year.

### Duties & Responsibilities:

- To perform scholastic research in cutting-edge areas of academic units and support teaching activities by conducting practical and delivering tutorials. PDF should be attached to a research group, not to an individual faculty. PDFs are expected to publish research articles with IIT Delhi affiliation in peer-reviewed scientific journals and present research work at reputed conferences.

### Tenure of Appointment:

- Initially one year (on contract, extendable for short term for candidates whose performance is assessed to be excellent).

### Academic Units and their Specializations/Research Areas:

**ACADEMIC UNITS: -**

1. **APPLIED MECHANICS:** Solid mechanics, Fluid mechanics, Design engineering and interdisciplinary areas of mechanics including but not restricted to Biomechanics,

Nanomechanics, Multifunctional materials and structures, Structural health monitoring, Soft robotics, Machine learning in mechanics, Two-phase flows, Environmental fluid flows, Granular flows, Solid-fluid interactions, Naval Architecture, etc.

2. **BIOCHEMICAL ENGG. & BIOTECHNOLOGY:** "Bioprocess and metabolic Engineering (Mammalian Cell Technology, Enzyme bioreactors, Bio-separation Engg with specialization in Chromatography and Nano-filtration, Genome Engineering), Systems and Computational biology (Quantitative biology, Synthetic biology) and Molecular biology of disease, Diagnostics and Bio-nanotechnology (Nano-biosensors, Therapeutics/drug delivery)"

3. **CHEMICAL ENGINEERING:** Renewable and Conventional Energy Technologies, Bioprocessing for Pharmaceuticals, Interfacial Energy and Nanotechnology, Molecular to Process Scale Simulation,Advance Novel Materials.

4. **CHEMISTRY:** All areas of Chemistry.

5. **CIVIL ENGINEERING: Environmental:** Sustainable Built Environment, Risk Assessment of Emerging Contaminants from Water, Aerosol Climate and Health, Carbon Sequestration using Alkaline Waste Materials; **Geotech:** Geotechnical Engg. / Rock Engg., **Structures:** Structural Engg. and Construction Management; **Transportation:** All areas of Transportation Engg., including but not limiting to, Transport planning, Traffic Engg., and Pavement Engg.; **Water Resources:** Water Resources and related areas.

6. **COMPUTER SCIENCE & ENGINEERING :** High Performance Computing and Visualization, Machine Learning and Artificial Intelligence, Wired and Wireless Networks, Mobile Computing and Machine-to-Machine, Algorithms & Complexity, Logic & Verification, Information Management, Data Science & Big Data, Computer Vision, Graphics & Robotics, Programming Languages, Semantics, Analysis & Language Implementation, Distributed & Multicore Computing, Cloud Computing, Cryptography and Systems & Information Security, Human Computer Interaction, Embedded Systems, Computer Architecture, VLSI and EDA.

7. **ELECTRICAL ENGINEERING: 1**. All research areas of Electrical Engineering including Integrated Electronic Devices & Circuits, Control & Automation, Communication, Signal Processing, Computer Technology, Power Systems, Power Electronics, Machines & Drives. **2.** Computer Technology: Computer Networking, Computer Architecture, SoC and VLSI design and testing, Sensor Networks, Embedded Systems, Parallel and Distributed Processing, Big Data Analysis, CAD for VLSI, Computer Vision and Image Analysis, Biometrics, Pattern Recognition, Machine Learning, Data Analytics, Neural Networks, Artificial Intelligence and Soft Computing, Multimedia Systems, Graph Theory, Systems Biology, Bioinformatics, Medical Informatics, Computational Linguistics, and Music and Audio Processing, Biomedical Signal/Image processing, Assistive Technology, Computational Neuroscience, Brain Computer or Human machine interface, Medical Electronics/Healthcare Technology, Cyber Security, Cyber-Physical Security. **3.** Semiconductor Devices, Materials, Fabrication, Characterization, VLSI Design, Photonics, Mixed-Signal Circuit design, RF Circuit design, NEMS, Neuromorphic, Nanoelectronics, Non volatile Memory Technologies, SRAM, DRAM, Quantum- Materials, Electronics and Computing, Photovoltaics, Sensors, Plasmonics, Compact modelling, Spintronics, MEMS, Analog Circuit Design, Circuit Testing, Fault-Tolerance, Fail-Safe Design, Microelectronics and Power Devices, Circuit Device Interaction, Circuit Device Optimization, 3D ICs, 3D Chips, Advanced semiconductor packaging, device reliability, Flexible and printable electronics, IR photodetectors, chemical sensors, energy harvesters and storage, optoelectronics, power semiconductor devices and wide-bandgap semiconductors, quantum materials, Biosensors, Biomedical devices, Nanofabrication, Growth and self-assembly of novel optical & electronic materials, Integrated nano-scale systems, Computational electromagnetics, Sensors : fiber-optic & chip-based, Biophotonics and bioimaging, Solid State Imaging, CMOS image sensors, Bio-inspired vision systems, Neuromorphic Imaging, Analog/Digital circuit design, Optoelectronics and Photonic, Modeling and characterization of Siliconbased qubits and CMOS at cryogenic temperatures for quantum computation, RF-CMOS devices and circuits, Reliability of CMOS and GaNHEMT devices, Radiation effects in CMOS, Semiconductor Hardware Security, Microfluidics,

Plastic MEMS, Microplasmas, Gas Phase Nanofluidics, Specialized hardware for Artificial Intelligence (Neuromorphic Computing), Nanomagnetism and Spintronics, Computational Neuroscience, Quantum Computing for Artificial Intelligence/ Machine Learning, Micro-magnetic Devices, nalog and Mixed signal circuit design, Data Converters (ADC and DAC), Phase locked loop (PLL) and Clock synthesizers, High speed circuit design, Low voltage circuit design, Nanorobotics, Electromagnetic Medical Devices and Implants, Nanofabrication, MEMS, Terahertz devices, Electronic devices and sensors, CMOS analog/RF/mm-wave integrated circuits & systems, CMOS cryogenic integrated circuits & systems for quantum computers, Device thermal reliability. **4**. Power Electronics and Machine Drives: All research areas in PEEMD including High Power Density Converter Design, Fast Chargers for EV, EV Power-Train Design, Solid State Transformer based Traction Converter, HVDC Technology, MMC Topology and Control, DC-DC Converters, Converter Design for POL/Data Centre Applications, High Frequency Transformer, Renewable Energy Systems, Active Filter for Power Quality Improvement, Non-linear Control Techniques in Power Electronics, Motor control for Induction motor, PMSM, PMBLDC etc. **5.** Smart grids, Electricity Markets and Deregulation, Power System Optimization, Modeling and control of Renewable Energy Systems, Vehiclegrid interaction, Demand side management, Adaptive Protection, Distributed Generation, Policy and Regulatory reforms in Electricity Sector, Wide area monitoring protection and control, Real-time simulation of power systems, SCADA, Hardware/Controller-in-loop simulations, Cybersecurity in power systems. **6.** Communications: Wireless Communications, 5G, beyond 5G and 6G, energy efficient signaling techniques, LPWAN, Massive machine type communications, grant-free access, backscatter communications, intelligent reflecting surfaces, Internet-things (IoT), energy harvesting, non-orthogonal multiple access, **7.** Signal Processing: EEG Signal Processing, Brain Source Localization, BCI for soft-exosuit/exoskeleton, silent communication (leaps/EEG/Air-writing) **8.** Application areas: Healthcare, genomics, smart sensors and systems, wearables, green technologies. **9**. Fundamental and applied mathematics relevant to research in Electrical Engineering. **10**.Fundamental and applied areas of physics, chemistry, and life sciences relevant to research in Electrical Engineering. **11**.Interdisciplinary areas relevant to the areas listed above.

8. **ENERGY SCIENCE & ENGINNERING:** Electrical Power Systems, Experimental Plasma Science and Technology, Internal Combustion Engines, Photovoltaic Devices and Systems, Solar Thermal Technology, Energy Storage.

9. **HUMANITIES & SOCIAL SCIENCES:** Economics, English (Literature), Linguistics, Philosophy, Policy Studies, Psychology, Sociology.

10. **MANAGEMENT STUDIES:** Information Systems.

11. **MATHEMATICS:** **Pure Mathematics:** Algebra, Dynamical System, Harmonic Analysis, Functional Analysis, Number Theory, Coding Theory, Cryptography, and Topology; **Applied Mathematics:** Numerical and Scientific Computing, Matrix Theory, Partial Differential Equations, and Wavelets and Applications; **Statistics and Operations Research:** Queuing Theory, and Optimizations; **Computer Applications:** Graph Theory, Statistical Classification and Clustering, Semantics and Language, Algorithms, and Combinatorics.

12. **MECHANICAL ENGINEERING:** All areas of Mechanical Engineering**.**

13. **PHYSICS:** Condensed Matter Experiments, Condensed Matter Theory, Computational and Statistical Physics, High Energy Physics, Plasma Physics, Physics of Quantum Matter, Optics and Photonics, Atomic and Molecular Physics

14. **TEXTILE AND FIBRE ENGINEERING:** Textile Engineering, Textile Technology, Textile Chemistry, Fibre Science & Technology, and other Engineering and Sciences (Such as Civil, Mechanical, Chemical, Electrical/Electronics, Materials, Polymers, Mathematics, Physics, Chemistry, Bio-Sciences and Management) with demonstrated research experience in areas relevant to textiles and fibres.

15. **APPLIED RESEARCH IN ELECTRONICS (CARE): Microwaves and RF**: Microwave components & Systems up to THz, active and reconfigurable antennas and antenna arrays, non-linear device modelling and MMIC, RFIC and RFMEMS; **Microelectronics**: MEMS and Microsystems, Micro sensors development for defense and space applications, THZ electronic devices, CMOS and III-V device simulation; **Signal Processing**: Underwater and Air Acoustics, Speech and Audio, Communications, Sensor Arrays, Multi-sensor Data Fusion, Machine Learning; **Multi-disciplinary**: Modern Radar Systems.

16. **ATMOSPHERIC SCIENCES (CAS):** All areas of Atmospheric and Oceanic Science.

17. **BIOMEDICAL ENGINEERING (CBME):** All areas of Biomedical Engg.

18. **RURAL DEVELOPMENT AND TECHNOLOGY (CRDT):** Rural Resources, Energy systems & Infrastructure; Resilience & Climate Change; Disruptive Technologies; Engineering Design, Artisanal/Agricultural Tools & Crafts; Indian Knowledge system, Skill Development & Entrepreneurship; Water resource management, Sanitation & Soil Health; Microbial & Biomass Technologies; Food science & Nutrition, Food processing & Technology (All above areas in rural context).

19. **NATIONAL RESOURCE CENTRE FOR VALUE EDUCATION IN ENGINEERING (NRCVEE):** All areas of Value Education in Engineering.

20. **CENTRE FOR AUTOMOTIVE RESEARCH AND TRIBILOGY (CART):** Power Electronics for EV applications, Battery management systems and other storage technologies for EVs, EV charging infrastructure and smart charging solutions, Vehicular Telematics and Embedded system for EVs, Connected and Autonomous EVs, Vehicle dynamics and control.

21. **BHARTI SCHOOL OF TELECOMMUNICATION TECHNOLOGY AND NAMAGEMENT (BSTTM):** All areas of Telecommunication Technology and Management.

22. **AMAR NATH & SHASHI KHOSLA SCHOOL OF INFORMATION TECHNOLOGY (ANSKSIT):** All areasof Information Technology.

23. **KUSUMA SCHOOL OF BIOLOGICAL SCIENCES (KSBS):** All areas of Biological Sciences.

24. **SCHOOL OF ARTIFICIAL INTELLIGENCE (ScAI)** : In all areas of artificial intelligence, Subareas of interest include (but are not limited to) deep learning, reinforcement learning, probabilistic models, data mining, information retrieval, multi-agent systems, knowledge representation and reasoning, mathematical foundations of AI, ethics of AI, applied AI such as NLP, computer vision, robotics, AI on the edge, etc., and applications of AI to domain areas such as healthcare, agriculture, education, industry 4.0, etc. ScAI strongly encourages applicants with demonstrated track-record of working at the intersection of an application area and the AI fields. More details are found at http://www.scai.iitd.ac.in

**NOTES:**

- The specializations or research areas mentioned above against each Department/Centre/School are only indicative and not exhaustive. The Institute is open to receiving applications from candidates with specialization in these as well as in other related areas.
- The minimum requirement of qualifications and/or experience may be relaxed in respect of exceptionally outstanding candidates in certain areas.

- A mere fulfilment of required minimum qualifications and experience does not entitle a candidate to be called for presentation/discussion.
- The Institute reserves the right to fill or not to fill the posts advertised.
- Separate online application must be filled, if a candidate is applying for a Post-Doctoral Fellowship in more than one Departments/Centres/or Schools.

**How to apply?**

- It is a requirement that the candidate visit the Job Section on IIT Delhi website (**http://www.iitd.ac.in/jobs-iitd/index.html**), prepare and submit the duly completed applications for appointment against the above position. The website also contains useful information on various aspects of working and living at IIT Delhi as well as on the recruitment process.
- As a precaution, after submitting the application through the website, please retain a printed copy of the application with you. Candidates employed with Government/Semi-Government Organizations or with Autonomous Bodies must print a copy of the electronic submission and submit the printed version through proper channel at the address given below.

**Address for Communication:**

**Joint Registrar (E-I)**
**IIT Delhi**
**Hauz Khas,**
**New Delhi – 110016**
**INDIA**
**Telephone: +91 11 26591716**
**Fax: +91 11 26597216**
**E-mail: fac_recruit@admin.iitd.ac.in**

**(updated on 01.07.2021)**