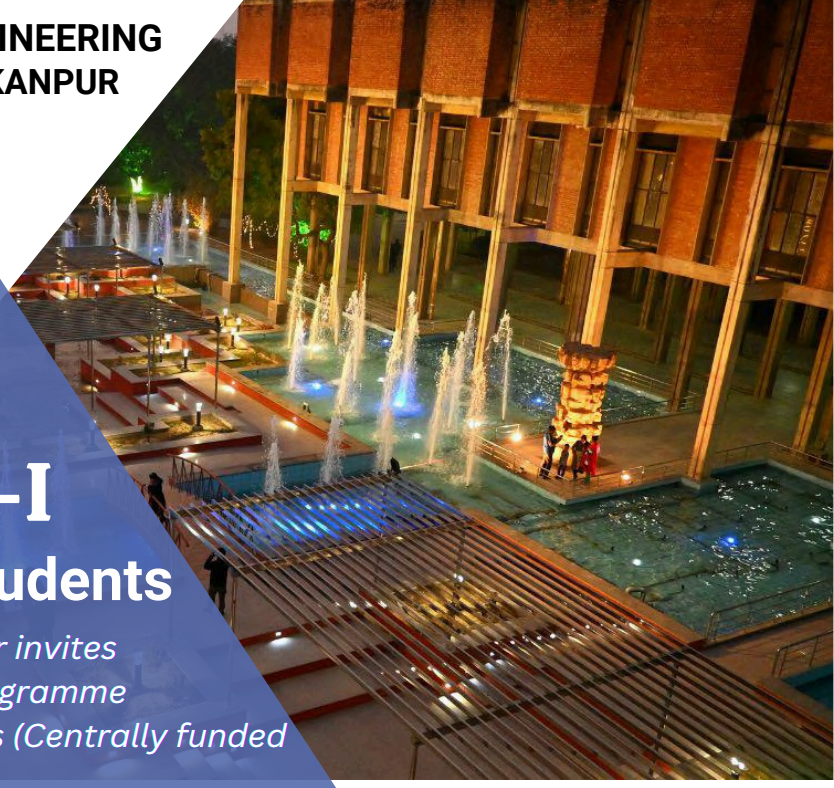
DEPARTMENT OF ELECTRICAL ENGINEERING
INDIAN INSTITUTE OF TECHNOLOGY KANPUR



Spot PhD Admission 2025-26 Semester-I

for CFTI BTech & MTech students

Department of Electrical Engineering, IIT Kanpur invites applications for spot admissions to the PhD programme from current BTech/MTech Students from CFTIs (Centrally funded Technical Institutes)

Specializations

- Control and Automation (CA)
- Microelectronics and VLSI (MVLSI)
- RF and Microwave (RF)
- Signal Processing, Communication and Networks (SPCOM)
- Photonics (PH)
- Power Engineering (PE)

Highlights

- Spot PhD admission with on-campus interview
- No GATE score required
- Institute assistantship up to INR 42,000 per month
- Eligible for applying for Visvesvaraya fellowship
- Travel support > Rs 2.8 Lakhs for national and international conferences
- Be part of cutting-edge research in exciting areas
- Opportunities to work with international universities/ exchange programs
- Startup/incubation via Student Entrepreneurship Policy

Who can apply?

- Final year BTech student in Electronics/Electrical department from a CFTI (including IITs/IISc /NITs/ IIITs /IISERs) with CPI > 7.5
- 2nd year MTech student Electronics/Electrical department from a CFTI (including IIT/IISc/NITs/IIIT/ IISERs) with CPI > 8.0

Important Dates

Online Interaction: 06 January 2025

Spot Interview: Jan - March 2025

Important Links

IITK/EE webpage:
https://www.iitk.ac.in/ee/
Admission webpage
https://www.iitk.ac.in/ee/admissionspot

admissionee@iitk.ac.in +91-512-679-6670; +91-512-679-2001

Indian Institute Of Technology Kanpur

Control &Automation, EE

Dr. Laxmidhar Behera

Research Interests : Intelligent control, quantum learning system, cognitive modelling, cognitive robotics, physics of complex systems, brain-computer interface.
https://home.iitk.ac.in/~lbehera/

Dr. Abhilash Patel

Research Interests : Dynamics and control of nonlinear systems, systems and synthetic biology, robust control theory, wide-area control.
https://home.iitk.ac.in/~apatel/

Dr. Ramprasad. Potluri

Research Interests : Practical applications of control theory, multi-motor coordination, independent steering and independent drive electric vehicles.
https://home.iitk.ac.in/~potluri/

Dr. Soumya Ranjan Sahoo

Research Interests : Analysis of nonlinear systems and control, cooperative control and application to robots and microgrids.
https://home.iitk.ac.in/~srsahoo

Dr. Tushar Sandhan

Research Interests : Signal processing, computer vision, reinforcement learning, machine learning, robotics, communication systems.
https://home.iitk.ac.in/~sandhan

Dr. Twinkle Tripathy

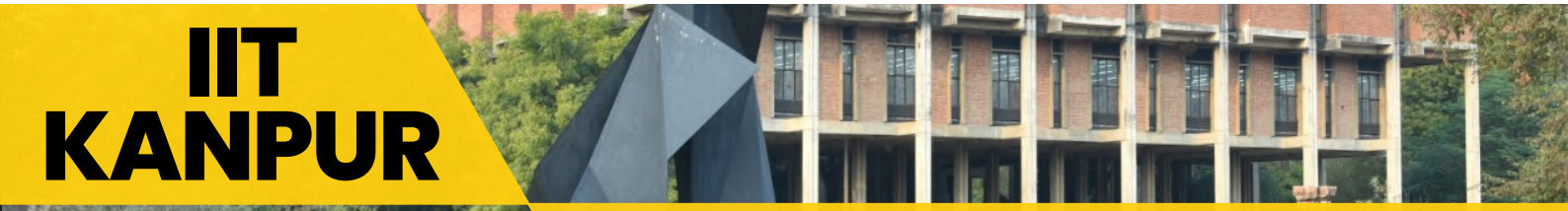
Research Interests : Guidance and control of autonomous vehicles, robotics and study of opinion dynamics in social networks.
https://sites.google.com/view/twinkletripathy/home

Dr. Nishchal K. Verma

Research Interests : Intelligent algorithms, machine learning, computer vision, smart grid, intelligent agents, brain computer interface and fuzzy controllers.
https://www.iitk.ac.in/idea/

Department Website

IIT KANPUR

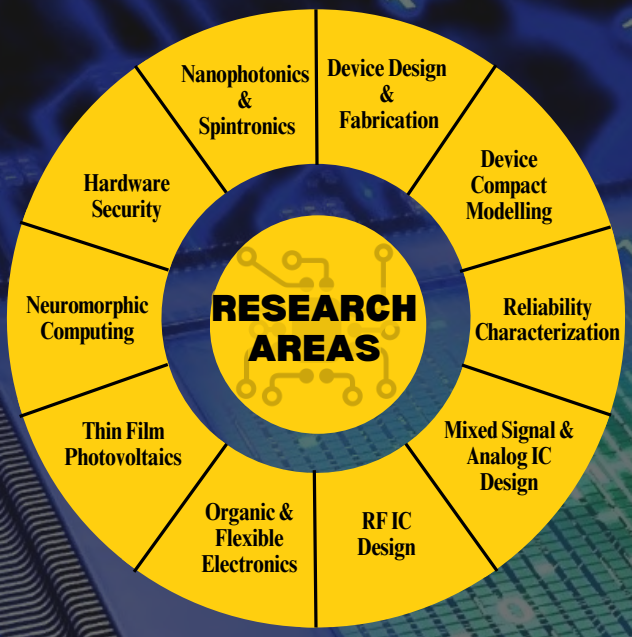


MICROELECTRONICS AND VLSI

Semiconductor design and manufacturing are complex and globalized processes, with VLSI & Embedded Design engineers working around the clock to bring new products to market. VLSI stands as a remarkable testament to human ingenuity and its profound impact in our daily lives.

One of the major factors leading to the remarkable development in the VLSI sector is the establishment of higher education institutions imparting knowledge across the country's different states. Investing in education will significantly pay off in the future.

The department has state-of-the-art research labs and support facilities in Microelectronics and VLSI. The faculty's research covers a wide spectrum, from fundamental studies to sponsored and consultancy projects, encompassing from circuit to device level, fostering interdisciplinary collaboration. Our research students are in high demand from top employers, who are eager to hire them for their skills and knowledge.



FACULTY MEMBERS

- Prof. Aloke Dutta
- Prof. Baquer Mazhari
- Prof. S. Sundar Kumar Iyer
- Prof. Yogesh Singh Chauhan
- Prof. Amit Verma
- Prof. Imon Mondal
- Prof. Rik Dey
- Prof. Shubham Sahay
- Prof. R.S. Ashwin Kumar
- Prof. Chithra
- Prof. Rituraj
- Prof. Avinash Lahgere
- Prof. Arnab Bose

INDUSTRY

GlobalFoundries · WTK · Texas Instruments · KEYSIGHT · Micron · Infineon · Qualcomm · cadence · MaxLinear

COLLABORATION

GOVERNMENT

अंतरिक्ष विभाग DEPARTMENT OF SPACE · विज्ञान एवं प्रौद्योगिकी मंत्रालय MINISTRY OF SCIENCE AND TECHNOLOGY · DRDO · इलेक्ट्रॉनिकी एवं सूचना प्रौद्योगिकी मंत्रालय MINISTRY OF ELECTRONICS AND INFORMATION TECHNOLOGY

ACADEMIC

Berkeley UNIVERSITY OF CALIFORNIA · TUM · NYCU NATIONAL YANG MING CHIAO TUNG UNIVERSITY · Notre Dame · EPFL ÉCOLE POLYTECHNIQUE FÉDÉRALE DE LAUSANNE

Indian Institute of Technology Kanpur

Microelectronics and VLSI

Electrical Engineering Department

Advanced Center for Electronic Systems(ACES)

Visit Us At

www.iitk.ac.in/ee/microelectronics-and-vlsi

IIT KANPUR

RF & Microwave Research Group

Department of Electrical Engineering, IIT Kanpur

RF and Microwave Group at Department of Electrical Engineering, IIT Kanpur uniquely offers academic training and research expertise in RF and Microwave domain ranging from passive to active microwave circuits. Major group objectives include encouraging scientific exchanges amongst academia and industry within the field of RF and Microwave, providing research support, consultation for industry and other government organizations.

Research Labs

- Microwave Circuits Lab
- Microwave Imaging and Material Testing (MIMT) Lab
- Antenna Lab
- RFID Lab
- Microwave Metamaterial Lab
- mmWave Research Lab

Facilities and Resources

- Vector Network Analyzer
- Handheld VNA
- Signal Analyzer
- Spectrum Analyzer
- Analog Signal Generator
- Noise Figure Analyzer
- RF Amplifier
- Digital oscilloscope
- RF Dielectric Testing Facility
- Measurement of Dielectric Properties
- Microwave Imaging
- Non-destructive Testing
- Anechoic Chamber
- Antenna Measurement Facility
- EMI/ EMC Test Facility
- PCB Fabrication Facility

Faculty Members

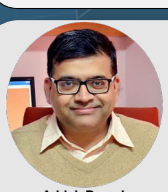
Prof. Animesh Biswas
Prof. A. R. Harish
Prof. M. Jaleel Akhtar
Prof. Kumar Vaibhav Srivastava
Prof. Raghvendra Kumar Chaudhary
Prof. Nagaditya Poluri

https://www.iitk.ac.in/ee/rf-and-microwaves

Signal Processing and Communications Group (SPCOM)
Department of Electrical Engineering,
IIT Kanpur

Website: https://iitk.ac.in/ee/signal-processing-communications-n-ws

SPCOM Faculty



Adrish Banerjee
PhD (Unversity of Notre Dame, USA)

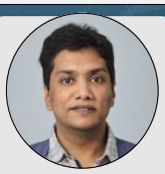
Error Control Coding, Machine Learning for Wireless Communications, Molecular Communications, Sequence Design, Terahertz Communications, Multiple Access for 5G and Beyond, D2M

A K Chaturvedi
PhD (Indian Institute of Technology Kanpur)

Wireless Communications, massive MIMO
5G and beyond systems

Aditya K Jagannatham
PhD (University of California San Diego)

6G/ 5G Technologies: OTFS, IRS, THz, VLC, Massive MIMO, mmWave MIMO, NOMA. Machine Learning, Deep Learning



Abhishek K Gupta
PhD (University of Texas at Austin)

6G and Beyond Wireless, Vehicular Networks, THz and Molecular Communication, Machine learning for Wireless, Quantum Communications

Rohit Budhiraja
PhD (Indian Institute of Technology Madras)

Design of 5G+/6G Cellular Systems and Technologies - hardware and algorithms, Machine Learning For Wireless Communications

Ketan Rajawat
PhD (University of Minnesota)

Optimization Algorithms, Trajectory Optimization of UAVs, Computational Cardiology

K Vasudevan
PhD (Indian Institute of Technology Madras)

Digital communications Coherent & non-coherent receivers, Synchronization, Channel estimation, Diversity techniques

Subrahmanya Swamy Peruru
PhD (Indian Institute of Technology Madras)

Wireless Networks, Machine Learning, Probabilistic Graphical Models

Yatindra N Singh
PhD (Indian Institute of Technology Delhi)

Peer to Peer networks, Optical Networks and switching, Digital Switching Systems, Distributed software systems

Nishchal Verma
PhD (Indian Institute of Technology Delhi)

Intelligent Data Mining Algorithms/Applications Health Monitoring, Intelligent Fault Diagnosis Systems, ML Algorithms, Computer Vision, Bioinformatics, ML Interface, UAV

Vipul Arora
Ph.D Indian Institute of Technology Kanpur

Machine Learning for Audio Processing, speech recognition, music information retrieval, generative AI

Tushar Sandhan
Ph.D. (Seoul National University, South Korea)

Computer vision, Machine learning, Robotics, Biomedical Signal processing radar, Wi-fi optical, EM-mm waves

Rajesh M. Hegde
PhD (Indian Institute of Technology Madras)

Sensor Array/Multi Channel Signal processing
Microphone array signal processing/Beamforming
Speech and Audio Coding and Recognition
Federated Learning for Edge and Fog Networks

Koteswar Rao Jerripothula
PhD (Nanyang Technological University (NTU), Singapore)

Computer Vision, Artificial Intelligence & Machine Learning, Multimedia Signal Processing, Image Processing, and Healthcare Informatics.

Nikunj A Bhagat
PhD (University of Houston)

Neural & Bio-signal processing, Medical Instrumentation, Brain-machine interfaces, Functional Electrical Stimulation, and Rehabilitation Engineering

Naren Naik
PhD (IISc Bangalore)

Tomographic imaging/tracking algorithms, Dynamic, shape and multimodal tomography, Functional biomedical imaging, satellite based remote sensing, Battlefield surveillance.

Washim Uddin Mondal
PhD (Indian Institute of Technology Kharagpur)

Reinforcement Learning (Sample Complexity, Algorithm Design), Game Theory (No-Regret Nash Equilibria), Multi-Agent Learning, Data-driven Resource Allocation and Scheduling in Wireless (5G/6G) and Optical Networks

Research Projects at Glance

- D2M: Direct to Mobile for Next Generation Broadcasting
- Analysis of Tera-hertz networks in presence of scatterers
- Semantic communications for cyber-physical systems
- Transceiver design of 6G systems,
- OTFS Radar, Joint Radar Communication, Integrated Sensing and Communication
- Research and Development of Wireless Technologies for 5G+/6G Cellular system
- Next Generation Wireless Research and Standardization on 5G and Beyond
- Navigation Systems for air, land, sea and subsea vehicles;
- Ballistic Computation Systems for firearms
- Realizing Large-Scale Swarms, Trajectory Optimization Algorithms for Onboard Processing, Path planning for UAVs and ground vehicle
- Federated Learning in Computer Vision
- Quantum and Molecular Communications
- Development of Fuzzy Rule based Gaussian Regression Model for Generating Future Images
- Underwater computer vision
- Application projects in space, nuclear and defense sectors.
- Visual human interfaces
- Functional biomedical imaging with fluorescence optical and photoacoustic tomography,
- Satellite based remote sensing of the atmosphere
- Biomedical image processing, AI in agriculture
- Cardiac digital twin
- Studying cognitive similarity of music using deep embeddings and behavioral studies with applications in music search and pedagogy
- Applications of graph neural networks for combinatorial problems in communication networks
- Brihaspati4: Peer to Peer networks-based systems
- Complex-valued Neural Networks for Computer Vision

IIT KANPUR

DEPARTMENT OF ELECTRICAL ENGINEERING

(PHOTONICS)

INVITES APPLICATIONS FROM ELIGIBLE CANDIDATES FOR

PHD PROGRAMME

FOR THE SESSION 2024-25

FACULTY

- PROF. G RAJSHEKHAR
- PROF. SHILPI GUPTA
- PROF. PRADEEP KUMAR K
- PROF. NAREN NAIK
- PROF. Y N SINGH
- PROF. RITURAJ
- PROF. DEBDATTA RAY

https://iitk.ac.in/ee/photonics

Light plays a critical role in our lives and the recent advances in photonics have enabled several revolutionary technologies. Fast internet, high resolution displays and cameras in our smartphones, virtual reality glasses, biomedical diagnostic tools, sensors, secure quantum communication, quantum computers, and the list goes on. The photonics group in the department of Electrical Engineering at IIT Kanpur has been pushing the frontier of photonic research and education with excellent state of the art facilities as well as industrial and academic collaborators across the globe.

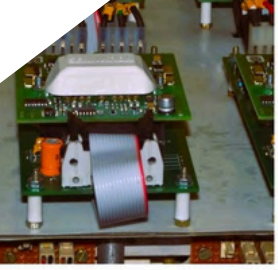
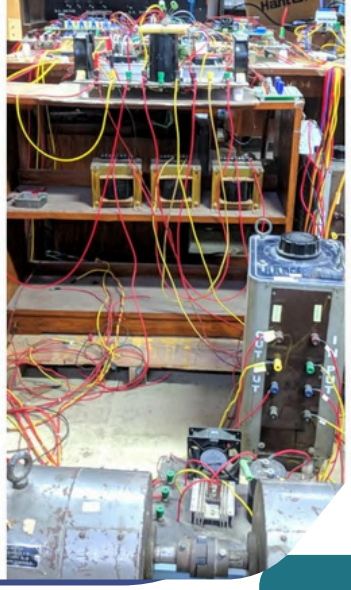
FACILITIES

- Optical Metrology and Imaging Lab
- Advance Fibre-Optics Lab
- Photonics Devices Lab
- Communication Networks Lab
- Tomography Imaging Lab
- Optoelectronics and Nanofabrication Lab

RESEARCH AREAS

- BIOMEDICAL OPTICS
- FIBER-OPTIC COMMUNICATION
- NANOPHOTONICS
- QUANTUM CRYPTOGRAPHY
- OPTICAL NETWORKING AND SWITCHING SYSTEMS
- SILICON PHOTONICS
- REMOTE SENSING AND BATTLEFIELD SURVEILLANCE

COLLABORATIONS

Awards and Recognitions (2023-2024)

Grid India Power System Award

Best paper Awards: ICMENS 24, Osaka, Japan, HV-ESCA, BARC, India, ICPEA 2024, Malaysia, NPEC2023, Guwahati

SIIC Student Innovation Award (SSIA)

POWER ENGINEERING

POWER ELECTRONICS

- **Piyush Kant** (PhD IIT Delhi) https://home.iitk.ac.in/~piyushkant/
- **Parthasarathi Sensarma** (PhD IISc Banaglore)https://shorturl.at/dnuW2
- **Shyama Prasad Das** (PhD IIT Kharagpur) https://shorturl.at/otFU0
- **Suvendu Samanta** (PhD Concordia Uni) https://home.iitk.ac.in/~suvendus/ .
- **Utsab Kundu** (PhD IIT Kanpur). https://sites.google.com/view/utsab-homepage/

Power Electronics Lab

The Department has the start of the art lab facilities and to name a few 1. 35 kW regenerative programmable AC/DC power supply with arbitrary input waveform, 2. Frequency Response Analyzer for measurement of converter hardware dynamics, 3. Automated coil winder for toroidal magnetics, 4. Camera based guided component placement and reflow soldering for PCB assembly with SMT & BGA components, 5. Extensive PLECS (circuit simulation), Altium (PCB CAD) software licences, 6. 2GSa/sec/channel, multi-channel, digital storage oscilloscopes, 100 MHz current probes, Rogowski probes.

Some of the Key ongoing Research Works in this lab includes: Wireless Power Transfer, On Board and Off Board EV Chargers, Power Management Circuits, EMI/EMC in Power Electronics, High Power Inverter Design and Drives.

POWER SYSTEM

- **Abheejeet Mohapatra** (PhD IIT Delhi) https://shorturl.at/bfzQ1
- **Ankush Sharma** (PhD IIT Kanpur) http://www.ankushsharma.com/ .
- **Gururaj Mirle Vishwanath** (PhD IIT Roorkee) https://home.iitk.ac.in/~gururajmv/)
- **Saikat Chakrabarti** (PhD MUN Canada) https://shorturl.at/jntDL.
- **Sri Niwas Singh** (PhD IIT Kanpur) https://home.iitk.ac.in/~snsingh/
- **Swathi Battula** (PhD ISU USA) https://home.iitk.ac.in/~swathi/
- **Ebin Cherian Mathew** (PhD IIT Delhi) https://home.iitk.ac.in/~ebincm/.
- **Soumya Ranjan Sahoo** (PhD IIT Bombay). https://home.iitk.ac.in/~srsahoo/.

POWER SYSTEM LAB

The Department has the start of the art lab facilities and to name a few 1. RTDS with 6 Racks capable of simulating 432+ nodes. 2. Typhoon HIL and Opal-RT which can help in Power Electronics Integrated Power System Studies. 3. Power Amplifier which is capable of carrying our Hardware in the Loop and Power Hardware in the Loop Experimentations. 4. AC-DC Hybrid Microgrid setup which has PV and Wind Renewable Emulators, Programmable Loads, Battery and EV Technologies. 5. Relay and PMUs for Protection based studies. 6. Smart IOT Lab suitable for smart grid related studies.

Some of the Key on going Research Works in this lab includes: Transactive Energy System Design, stability and control of power systems with penetration of renewable energy, HVDC and MVDC transmission systems, Smart Grid Technology, State Estimation, Power system security, Uncertainty modelling, Power System Protection, Machine learning applications to power systems,

HIGH VOLTAGE

- **Alok Ranjan Verma** (PhD IISc Bangalore) https://home.iitk.ac.in/~arverma/
- **Nandini Gupta** (PhD IISc Bangalore) https://home.iitk.ac.in/~ngupta/

HIGH VOLTAGE LAB

The department has a large high voltage laboratory equipped with state of art facilities (e.g. Dielectric Spectroscope, PEA, ERT).

Research in this lab is directed towards nanodielectrics, multi-functional materials for power apparatus, gas and plasma discharges, outdoor insulation and HVDC cables, numerical techniques applied to dielectrics.

PUBLICATIONS

In the past 5 years, more than 150 papers from various faculties and their research students were published in reputed and premier international journals.

FUNDED RESEARCH PROJECTS (BASED ON AVAILABILITY)

- Opportunity to Work Under Various Research Projects.
- Get Practical Flavor to the Research Problem.
- Exciting Incentives and Funding Support to Attend Workshops and Conferences.

Department of Electrical Engineering,
IIT Kanpur, Kalyanpur 208016