About the Department

Welcome to the Department of Electrical Engineering (EE) at IIT Kanpur. The EE department is one of the oldest departments at IIT Kanpur. It was one of the first five departments with which IIT Kanpur started in 1960,

Widely recognized as a pioneer in the field of Electrical Engineering in India.

It offers B.Tech, M.Tech, MS by Research, dual-degree i.e.(B.Tech. + MTech.) and PhD, MTech-Phd programs .

The current sanctioned strength of B.Tech and M.Tech student intake during the first semester, are approximately 136 and 150, respectively. At present, 241 Ph.D., 260 MTech., 62 M.S (by research), and 620 BTech students are registered in the department, against the sanctioned intake. It may be noted that the number of postgraduate (MTech, M.S (R), and Ph.D.) students has nearly doubled in the last five years,

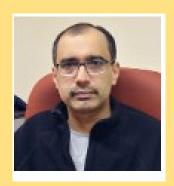
The department has a total faculty strength of 50, 3 research engineers, 26 technical staff, 7 ministerial staff, and a large number of research project employees.

The department currently houses 35 research labs and 9 teaching labs.

The research interests of the faculty members encompass a wide gamut of

sub-disciplines of Electrical Engineering Collaboration with faculty members from other disciplines, both within and outside the institute, is encouraged. The research activity of the department includes fundamental research, sponsored and consultancy projects, carried out with active participation of the students, faculty, staff and research engineers.

Head of the Department



PROF. RAJESH MAHANAND HEGDE
[HEAD OF DEPARTMENT]

DEPARTMENT OF ELECTRICAL ENGINEERING

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DEPARTMENT PLACEMENT COORDINATOR



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Recent Notable Contributions

- 1: THE RESEARCH PAPER OF MR. SAPTARSHI GHOSH [EE], PROFESSOR KUMAR VAIBHAV SRIVASTAVA HAS RECEIVED THE MOTOHISA KANDA AWARD 2021, WHICH IS GIVEN FOR THE MOST CITED PAPER OF THE IEEE TRANSACTIONS ON ELECTROMAGNETIC COMPATIBILITY IN THE PAST FIVE YEARS.
- 2: MR. ASHOK TRIPATHI, A PHD STUDENT OF PROF. AMIT VERMA, RECEIVED THE BEST PAPER AWARD AT THE 2021 IEEE 6TH INTERNATIONAL CONFERENCE ON COMPUTING, COMMUNICATION AND AUTOMATION [ICCCA].
- 3: PROF. LAXMIDHAR BEHERA APPOINTED AS THE DIRECTOR OF IIT MANDI FOR A PERIOD OF FIVE YEARS.
- 4: MR SHYAM AB, A PHD STUDENT OF PROF SANDEEP ANAND AND PROF SOUMYA RANJAN SAHOO RECEIVED THE BEST CONTRIBUTORY PAPER AWARD AT THE 9TH INTERNATIONAL CONFERENCE ON POWER SYSTEMS 2021.
- 5: MR ARNAB SARKAR, A PHD STUDENT OF PROF. SANDEEP ANAND, RECEIVES THE THIRD PRIZE IN THE IEEE APALA BANERJEE, A PHD STUDENT OF PROF. JALEEL AKHTAR AWARDED FIRST PRIZE IN THE BEST FEMALE STUDENT PAPER CATEGORY IN THE INTERNATIONAL MICROWAVE AND RF CONFERENCE [IMARC 2021].
- 6: E-IES STUDENT AND YOUNG PROFESSIONAL COMPETITION 2021 ORGANIZED BY IEEE INDUSTRIAL ELECTRONICS SOCIETY.
- 7: PROF. ABHEEJEET MOHAPATRA HAS BEEN SELECTED FOR THE INAE YOUNG ENGINEER AWARD 2021.
- 8: PROF SAIKAT CHAKRABARTI AND PROF YOGESH SINGH CHAUHAN HAVE BEEN ELECTED TO THE FELLOWSHIP OF THE INDIAN NATIONAL ACADEMY OF ENGINEERING 2021.
- 9: DR. SOUMYA SAHOO HAS BEEN AWARDED THE BATCH OF 1970 YOUNG FACULTY FELLOWSHIP.
- 10: DR. PRADEEP KUMAR HAS RECEIVED THE P K KELKAR RESEARCH FELLOWSHIP AT IIT KANPUR

Recent Notable Contributions

- 11: DR. ABHEEJEET MOHAPATRA HAS RECEIVED THE DEVENDRA SHUKLA YOUNG FACULTY FELLOWSHIP AT IIT KANPUR.
- 12: PROF. ANIMESH BISWAS HAS BEEN CHOSEN FOR 2020 IETE -RAM LAL WADHWA AWARD FOR OUTSTANDING ORIGINAL CONTRIBUTION IN THE FIELD OF ELECTRONICS AND TELECOMMUNICATION DURING THE LAST 10 YEARS.
- 13: PROF. S. C. SRIVASTAVA HAS RECEIVED THE DISTI<mark>NGUISHED TEACHER AWARD 2020 AT</mark>
 IIT KANPUR
- 14: PROF. A. R. HARISH HAS RECEIVED THE EXCELLENCE TEACHING AWARD 2020 AT IIT KANPUR.
- 15: PROF. K. V. SRIVASTAVA HAS RECEIVED THE EXCELLENCE-IN-TEACHING AWARD 2020 AT IIT KANPUR.
- 16: PROF. SAIKAT CHAKRABARTI HAS BEEN SELECTED AS SAJANI KUMAR RAY MEMORIAL CHAIR PROFESSOR
- 16: PROF. ADRISH BANERJEE HAS BEEN SELECTED AS SINCLAIR BROADCASTING CHAIR PROFESSOR
- 17: PROF. ADITYA JAGANNATHAM HAS BEEN SELECTED AS ARUN KUMAR CHAIR PROFESSOR
- 18: CHIRAG KUMAR [SUPERVISOR: PROF. K. RAJAWAT] RECEIVED THE BEST ORAL PRESENTATION AWARD AND RUCHI TRIPATHI [SUPERVISOR: PROF. K. RAJAWAT] RECEIVED THE BEST POSTER PRESENTATION AWARD AT RESEARCH CONCLAVE'19 AT IIT GUWAHATI.
- 19: THE TEAM COMPRISING OF PARVRAJ PACHORE, YUGAL GUPTA AND NACHIKETA DESHMUKH UNDER THE GUIDANCE OF DR. SANDEEF ANAND HAS WON THE DST-LOCKHEED MARTIN-TATA TRUSTS IIGP 2.0-UNIVERSITY CHALLENGE 2019.

Recent Notable Contributions

- 20: THE TEAM OF MOHAMAD AASIF BHAT AND ANTESHWAR CHIMADGE WITH DR.
 IMON MONDAL IS ONE OF THE ELEVEN WINNING TEAMS SELECTED FOR QUALCOMM
 INNOVATION FELLOWSHIP 2020.
- 21: THE PAPER TITLED 'OPTIMAL TRANSMISSION SWITCHING WITH INJECTION UNCERTAINTIES' BY SNEHIL CHANDRA, P NAGA YASASVI, PROF. ABHEEJEET MOHAPATRA AND PROF. S. C. SRIVASTAVA IS ONE OF THE BEST CONFERENCE PAPERS ON PLANNING, OPERATIONS, AND ENERGY MARKETS SUBMITTED TO THE 2020 IEEE POWER ENERGY SOCIETY GENERAL MEETING.
- 22: THE TEAM OF THARUN KUMAR REDDY, MADHURDEEP JAIN, ARCHIT BANSAL, PALASHDEEP SINGH, KUSHANGI MITTAL WITH PROF. L. BEHERA AND PROF. V. ARORA GOT WORLDWIDE SECOND POSITION IN THE CLINICAL BCI CHALLENGE AT IEEE WORLD CONGRESS ON COMPUTATIONAL INTELLIGENCE[WCCI] 2020.
- 23: DR. EKANT SHARMA (SUPERVISORS: PROF. R. BUDHIRAJA AND PROF. K. VASUDEVAN]
 RECEIVED THE BEST DOCTORAL DISSERTATION AWARD WITH HONORABLE MENTION
 AT THE 13TH INTERNATIONAL CONFERENCE ON SIGNAL PROCESSING AND COMMUNICATIONS
 HELD AT IISC BANGALORE.
- 24: THE PAPER TITLED 'SPATIAL HRTF INTERPOLATION USING SPECTRAL PHASE CONSTRAINTS' BY ADITYA SRIVASTAVA, GYANAJYOTI ROUTRAY, AND PROF. R. M. HEGDE IS ONE OF THE FINALISTS O.PD FOR BEST STUDENT PAPER AWARD AT THE 13TH INTERNATIONAL CONFERENCE ON SIGNAL PROCESSING AND COMMUNICATIONS HELD AT IISC BANGALORE.

INFRASTRUCTURES: LABS AND FACILITIES

Control and Automation

Networked Control Systems Lab.

Intelligent Systems Lab.

Intelligent Informatics and Automation

Lab.

Microelectronics and VLSI

Semiconductor Device Fabrication Lab.

VLSI - EDA Lab.

Organic Electronics Processing and Characterization Lab.

Nano Lab.

Photonics

Fiber and Quantum Optics Lab
Optoelectronics and Nanofabrication
Lab.

Quantum Photonics Lab
Tomographic Imaging Lab

Signal Processing Comm. and Networks

Computer Vision Lab.

Mobile Communications
Lab.

Multimedia Wireless

Networks Lab.

Multimodal Information

Processing Systems Lab.

Networks Lab.

Wireless Communications

Coding and Cognitive

Radio Lab.

Telematics Lab.

Wireless Sensor Networks
Lab. WiSDOM lab.

5G Test Lab.

Power Engineering

High Voltage Lab NaMPET Lab.

Networked Control Systems Lab.

Power Management Lab

Power System Simulation and

Research Lab

Static Controller Lab

Power Electronics for Renewable

Integration(PERI) Lab

RF And Microwaves

High Voltage Lab NaMPET Lab.

Networked Control Systems
Lab.

Power Management Lab.

Power System Simulation and Research Lab.

Static Controller Lab.

Power Electronics for Renewable Integration (PERI) Lab.

INFRASTRUCTURES: LABS AND FACILITIES

Control and Automation

Software: Visual

Studio, Eclipse, Arduino Programming

Equipment: Arduino

Platform Boards, Microsoft Kinect for Image Processing

Microelectronics and VLSI

Software: - Xilinx, Mentor Graphics, Cadence, ICCAP, HSPICE, Sentaurus TCAD, Silvaco TCAD

Equipment: FPGA kits (Spartan 3E, Virtex2Pro, etc.), Spin Coater, Vacuum Annealing System, Agilent Semiconductor Characterization System.

Photonics

Software: Comsol Multiphysics,
Pspice, Optilux, Cuda GPU
Programming, FPGA

Equipment: - Optical Spectrum Analyzer, Fiber Optics Cable, Lasers (Co2,

HeNe), Lockin Amplifier, Spectrum
Analyzer, Nanofabrication and
Imaging Tools like FIB, SEM, and
AFM, Optical Fiber Components
, Pspice, Altium

Signal Processing Comm. and Networks

Software: CVX, C/C++,

Python, Simulink, Mathematica

, Matlab. **Equipment** : Digital

Oscilloscope, Frequency

Analyzer, FPGA, RTDS,

USRPs

Power Engineering

Software: PSPICE,

Microchip, Altium,

PSCAD, OPAL

RT, GAMS, RTDS, DIGSILENT

Equipment: Digital

Oscilloscope, Frequency

Analyzer, FPGA, RTDS

RF And Microwaves

Software: -Cadence,
CST Studio Suite, HFSS13.0,
NEC, Mapple, Matlab,
Advance Design System
(ADS)

Equipment: VNA, DSO, Freq. Generator, Anechoic Chamber, Spectrum Analyzer.

Academic Courses

Mathematical Structures of

Signals and systems.

Convex Optimization in Signal

Processing and

Communication.

Statistical Signal Processing-1.

Machine Learning for Signal

Processing.

Image Processing.
Introduction to Signal
Analysis.

Optimization for Big Data.
Computational Aspects of
Tomographic Imaging:
Models to inversions.

AI, ML and its applications.

Advanced Topics in Machine.

Data Structures and Algorithm for EE.

Electromagnetic Theory. **Integrated Circuit Fabrication Technology. VLSI System Design Analog/Digital VLSI** Circuits. Solid State Devices. **Semiconductor Device Modelling. Compact Modelling. High Frequency Analog Circuit** Design. **Physics of Semiconductors** and Nanostructures. Introduction to Flexible Electronics. Memory Technology and Neuromorphic Computing. Special topics in Microelectronics. RF Microelectronics.

Communication Systems. **Basics of Modern Control System.** Non-Linear systems Digital Control. Kalman Filtering and Applications. **Robust Control** Systems. Fuzzy set, logic systems and applications. **Smart Grid Technologies** Fiber optics communications. Semi conductor **Optical Communication** Devices. **Charge and Heat Transport in** Semiconductors. Advanced topics in machine learning for communication networks.

Academic Courses

Optical coherent Imaging. Detection and Estimation Theory. **Topics in stochastic** Processes. Speech Signal processing. Representation and **Analysis of Random** Signals. Digital Switching. Peer to Peer Networks. **Analysis of Modern** Wireless Networks. **Machine Learning for** Wireless Communications. **Information Theory Coding Theory.** Wireless Communication. Digital Communication. **MIMO Wireless** Communication.

Simulation of Modern Power System. **Economic Operation and Control of Power** Systems. **Electrical Insulation in Power Apparatus and** systems. **Synchrophasor Technology and its** Applications. **Advanced Power system** Stability. **Control Techniques in Power Electronics. Electric Power System Operation and Mgmt.** under restructured environment. **Advanced Electric Drives.** Power converters for EV Charging. **High Voltage Power Transmission Engineering.** Mixed Signal Design.

Basics of Electronics Converters. **Fundamentals of Electric** drives. **Power Management Circuits. Smart Grid Technologies.** Advanced RF Antennas. **Smart Antennas for Mobile** communication. **Electromagnetic Interference** and compatibility Techniques. Microwave Measurement and Design. Microwave Circuits. Finite Element Method for **Electric and Magnetic Fields.** Monolithic Microwave ICS. Advanced Engg. **Electromagnetics. Analog circuits for Signal**

Processing

Control and Automation

- 1: Facial Expressions Analysis and Emotions Recognition.
- 2: A Condition Monitoring System With Multi Agent Mechanism For External Non Contact Smart Inspection Of Buried Oil And Gas Pipelines.
- 3: Automatic Book Copier.
- 4: Learning Robotic Motor Skill, Visual Control And Perception For Warehouse Automation.
- 5: Human-Driven Full-Size 4ws4wd Electric Vehicle.
- 6: Control of Cyber-Physical Systems- Applications to Smart Grid and Formation of UAVs Multi-Mobile Wireless Sensor Networks in Tracking and Surveillance.
- 7: A Condition Monitoring System With Multi Agent Mechanism for External Non Contract Smart Inspection of Buried Oil and Gas Pipelines .
- 8: Development of Unmanned Aerial Vechicles (UAV) Aided Driver Assistance System.
- 9: Cyber-Physical Control of Grid Connected Photovoltaic Distributed Generation System Teaching Learning Centre for Internet-of-Things.
- 10: Development of an Autonomous Mobile Man<mark>ipulator System for Ware-House Applications:</mark> Stowing and Picking Condition Based Monitoring of Air Compressors and Motors.
- 11: Mechanical Design, Development And Control Of A Serial Six Axis Manipulator Arm For Intelligence And Complex Manipulation Tasks.
- 12: Nano Uavs (Like Insect Copter) For Video Capture
- 13: Software Design For Autonomous Quadrator
- 14:Intelligent Control Of Multi Robot Systems Based On Serial And Parallel Manipulators In Cyber Physical Framework.
- 15: Sparc:Deployment Of Low-Cost MultiRotor Mini-Uavs For Early Detection Of Crop Diseases
 And Development Of An Optimal System For Management
- 16: Design And Control Synthesis Of A TiltRotor Quadcopter.
- 17: Vajra Faculty Scheme.

RF and Microwave

- 1: Application of Meta-Material Mushroom Structure for Realization of Planar Single/Triple Passband Filter for Significant Size Reduction
- 2: Microwave Active Remote Sensing of Buried Objects.
- 3: High Power Device Analyzer, Enhancement Of Existing Vna, Time Resolved Correlation Measurement, Power Electrics, Antenna Positioner System.
- 4: Investigation On Rcs Reduction Characteristics Of Conformal Narrow Band Metamaterials Absorber For Complex Shapes.
- 5: Design Of Conformal Microwave Metamaterial Absorber.
- 6: Develop A Compact Microwave Sensor for Characterization of Radomes and Dielectric Signature Detection of Materials In 3g and 4g Ism Bands.
- 7: Microwave Imaging Material Testing Project.
- 8: Development of Microwave Sensor System for Humanitarian Technology Applications.
- 9: Design of Compact Multi-Band Multi-Polarized Antennas for Wireless Communication Systems.
- 10: Microwave Metamaterial Absorbers 9: BSNL Telecom Centre of Exellence.
- 11: Design Of Antenna Element And Array.
- 12: Centre For Railway Research.
- 13: Microwave Imaging Remote Sensing of Concealed Object.
- 14: Design Of Polymer Nanocomposites B<mark>ased Wideband Microwave Absorbers</mark>
 For Stealth And Electromagnetic Shielding Applications

Signal Processing, Communications Networks

- 1: BSNL Telecom Centre of Exellence.
- 2: Joint Target Detection and Localization Algorithms for Mimoradar Systems.
- 3: Qualcomm Wireless Short Course.
- 4: Cooperative Communication In Cellular Networks Protocol Design and Performance Analysis
- 5:Device To Device (D2D) Communications for LTE-Advanced Cellular Network.
- 6: Cross-Layer Optimization Techniques In Video Streaming Over Wireless Fading Networks.
- 7: Inspire Faculty Research Grant.
- 8: Inspire Faculty Award.
- 9: Joint Target Detection And Localization Algorithms For Mimoradar Systems.
- 10: Development Of Commercial Package For Restoration Of Old Films And Videos.
- 11: Virtual Full-Duplex Relaying For Cellular Netwrks Using Half-Duplex Relays.
- 12: Electronic Digitization Of Biomolecules For Rapid And Real Time Detection Of Human Pathogens Using Npt.
- 13: Fog Visibility Enhancement.
- 14: Underlay Cognitive Radio Based Satellite Terrestrial Non-Cooperative/Cooperative Communication For Efficient Resource Utilization....Performace Analysis.
- 15: Space Time Trellis Coding (Sttc)/Turbo Coding Based Robust Satellite Image Processing And Communication.
- 16: Stochastic Optimization In 5g Networks.
- 17: Minimum Phase Hrtf Modeling Using Fbs Interpolation In Spherical Harmonic Domain For Spatial Audio Systems.
- 18: Deployment and Management of Brithaspati-3 Services Over NKN for Indian Academia.
- 19: Development of Personalised and Performance Based E-Learning Tool for Existing E-Resources.
- 20: Application Aware Image Quality Evaluation of Result Sensing Images.
- 21: Commercially Viable Professional Courses.
- 22: National Conference on Communications (NCC).
- 23: Design & Development Of Aquatic Autonomous Observatory (Niracara Svayamsasita Vedhshala-Nsvs) For In Situ Monitoring, Real Time Data Transmission & Web Based Visualization (Sub Project-C) Dett. Of Ee.
- 24: Intel India Faculty Excellence Program.
- 25: Physical Layer Design Techniques For Next Generation Cellular Technologies.
- 26: Non Contact Metrology Of Hexagonal Wrapper Tube Throgh Glass Medium
- Indigenous 5g Test Bed Design.

Photonics

- 1: Fluorescence Diffuse Optical Tomography for Grading of Dysplasia In Cervical Cancer Progression.
- 2: Rte-Tomography Based Cloud Monitoring.
- 3:Brihaspati Erp System Deployment In Igntu Amarkantak.
- 4: Development Of Thunderbird Plugin Based P2p Messaging Client.
- 5: Software Development Activities In Edrp Components.
- 6: Design, Fabrication And Characterization Of Nanoparticle-Based Photonic Elements.
- 7: Quantum Key Distribution Using Magneto-Optic Interactions In Epitaxial Garnet Films.
- 8: Electro-Optic and Mangneto-Optic Interaction Based High Speed Quantum Key Distribution.
- 9: Development of Frequency Coded Quantum Key Distribution Solutions Suitable for Development On 25 Km Fibre Optic Links.
- 10: Photodiode Arrays for Near
- Infrared Detection and Tracking.
- 11: Integrated Nanophotonic Devices Operating at Room Temperature.
- 12: Multi Component Signal Analysis Method in Digital Holography for Precision Metrology.
- 13: High Throughput Surface Characterization Using Coherent Optical Imaging.
- 14: Development Of Non-Ivasive Techniques For Nanoscale Surface Metrology.
- 15: Design, Fabrication And Characterization Of Nanoparticle Based Photonic Elements.

Microelectronics and VLSI

- 1: Study of Electrodes In Organic Solar Cell for Efficency and Reliability Improvement.
- 2: SMDP-C2SD.
- 3: Special Manpower Development Programme for Chips To System Design.
- 4: Modeling Advanced FDSOI for IC Design.
- 5: Hemt Modeling for Broad Temperature and Frequency Ranges.
- 6: Modeling and Simulation of III-V and Ge Transistors for Logic and Power Applications.
- 7: Characterization and Modeling of Gan Hemt for RF Applications.
- 8: Modeling of Advanced Bulk and Soi Mosfets.
- 9: Characterization and Modeling of Radiation Hardened Cmos Transistors for Space.
- 10: Integration and Enablement of 0.18micron Rf-Soi Technology for Analog Mixed-Signal Applications.
- 11: Atomistic Simulation And Compact Modeling Of Alternate Channel Materials For Nanoscale Devices.
- 12: Ramanujan Fellowship.
- 13: Application of Meta-Material Mushroom Structure for Realization of Planar Single/triple Passband Filter for Significant Size Reduction.
- 14: Design and Development of Control and Protection for Hybrid Renewable Integration.
- 15: Codes for Distributed Storage.
- 16: Photodiode Arrays for Near Infrared Detection and Tracking.
- 17: Photodiode Arrays for Near Infrared Detection and Tracking.
- 18: Development Of Compact Model For Sspl'S Gan-Hemts.
- 19: Pdk Development And Modeling Support For ISRO's Gan Hemt Technology.
- 20: Asm-Gan-Hemt.

Power Engineering

- 1: Electric Stress Control Using Filled Polymers.
- 2: Reconfigurable Distribution Networks.
- 3: Stabilize Energy.
- 4: Uk India Clean Energy Research Institute.
- 5: Indo-Uk Center For Education And Research In Clean Energy (Sub Project-A).
- 6: Integrated Dc-Dc Converter Based Grid Connected Transformerless Photovoltaic Inverter.
- 7:Uk India Clean Energy Research Institute.
- 8: Re-Synchronizable Grid Interactive Inverters For Indian Rooftop Solar Pv Systems.
- 9: Indo-Uk Center For Education And Research In Clean Energy.
- 10: Indo-Uk Center For Education And Research In Clean Energy (Sub Project-B).
- 11: Ui-Assist: Us India Collaborative For Smart Distribution System With Storage.
- 12: Ui-Assist: lit Kanpur Centre Budget.
- 13: Ui-Assist:lit Kanpur R&D Budget.
- 14: Ui-Assist:lit Kanpur Pilot 1 Budget.
- 15: Ui-Assist:lit Kanpur Pilot 3 Budget.
- 16: Ui-Assist:lit Kanpur Pilot 2 Budget.
- 17: Design & Development of Intelligent Electronic Transformer.
- 18: A Multi Dimensional Smart Energy Grids Analysis for Indian Scenario.
- 19: Adaptive Clustering for Decentralized Resilient Energy Management (ADREM).
- 20: Technical Vetting of Electrical Estimates.
- 21: Development of Control Strategies for Grid Connected <mark>Pv System Utilizing The Mppt and Reactive Power Capability</mark>
- 22: Technical Vetting of Electrical Distribution Design of Alaknanda Enlcave.

OUR PAST RECRUITERS

many more...



























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STUDENTS' PLACEMENT
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