

VOLUME 2 | ISSUE 1 | JANUARY - JUNE 2025



IIT Kanpur

NEWSLETTER

DEPARTMENT OF ELECTRICAL ENGINEERING

Indian Institute of Technology Kanpur





Prof. Yogesh Singh Chauhan

Head EE IIT, Kanpur

From Head's Desk

Continuing the trend of connecting with our readers and well-wishers, we have come up with the second edition of the newsletter. This newsletter aims to cover all major events and achievements of our department from January to June 2025. The highlights of this issue are the research work and accomplishments of our students and faculty members. This newsletter will also enlighten you about the breakthrough technological developments by our faculty members and their role in the betterment of society. We have also set up a new "Electromagnetic Interference and Compatibility (EMI/EMC) and Electrical Safety Test Facility for electrical and medical devices," which is fully accredited by the National Accreditation for Testing and Calibration Laboratories (NABL). The project details shared in this issue will demonstrate the expanding industry and research collaboration. I'm also pleased to highlight recent publications of our department in top-tier journals and several successful grant proposals that will further expand our research capacity. We also welcomed our new faculty member, Prof. Nagarjuna Nallam, to our dept. as an Associate Professor.

In this issue, we will cover the 58th Convocation ceremony held at our department. With immense pride, I state that a total of 377 students graduated, and 16 students have distinguished themselves by winning medals and awards. The ceremony was graced by our Guest of Honor, Dr. Meena Mishra, Director, SSPL-DRDO.

Looking ahead, we prepare for the new academic year, where we are committed to preparing the next generation of engineers to tackle tomorrow's challenges.

Thank you for being a part of our community. Your continued support and engagement are vital for our success.



WORKSHOPS CONDUCTED



Three-Day Workshop on "Pre-Compliance and Full-Compliance EMC Testing Techniques." Organized by EMI/EMC & Electrical Safety Test Facility. Coordinator: Prof. M. Jaleel Akhtar, Dept. of EE, IIT Kanpur.



Department of Electrical Engineering, IIT Kanpur organized a national level workshop sponsored by DRDO on "Metamaterial Antennas and Applications," uniting experts to advance next-generation wireless and defense technologies.



WORKSHOPS CONDUCTED



IEEE Women in Engineering (WIE) / Women in Microwaves (WiM) Workshop on "RF Engineering for Sustainability," organized by the IEEE MTT-S Student Branch Chapter, IIT Kanpur.



Department of Electrical Engineering conducted a "Hands-on workshop on basic electronics for school students" from May 26 to June 6, 2025, followed by certificate distribution.



Prof. Jaleel Akhtar, Dept. of Electrical Engineering, IIT Kanpur, organized a one-day Workshop titled "From Innovation to Impact: BIS Standards for Deep Tech Excellence" in collaboration with Bureau of Indian Standards (BIS) and Startup Incubation and Innovation Centre (SIIC), IIT Kanpur.



Prof. Nagarjuna Nallam

Associate Professor

<https://home.iitk.ac.in/~nallam/>



Dr. Manoj Kumar

DST-INSPIRE Fellow

INSTITUTE POST-DOCTORAL FELLOWS



Dr. Aditi Srivastava

Control System



Dr. Deepak Singh

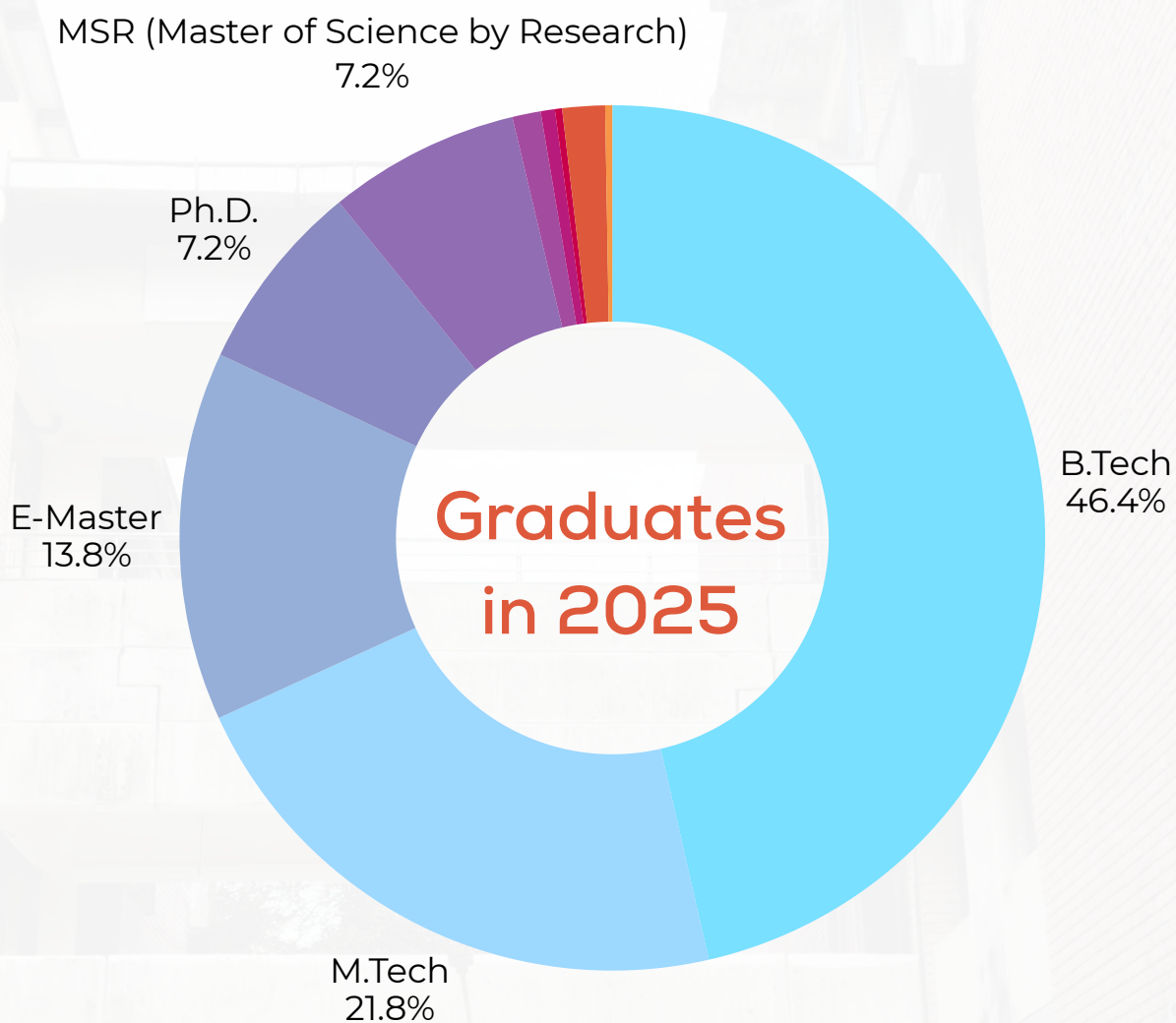
Multilevel inverters, switched-capacitor-based inverters, grid-connected photovoltaics, high power multilevel EV charges.



Dr. Neelu

Semiconductor devices, material synthesis & characterization, wide bandgap materials, photodetectors, solar cells





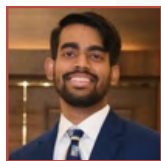
Program	Graduates
🎓 B.Tech	175
🎓 M.Tech	82
🎓 E-Master	52
🎓 Ph.D.	27
🎓 MSR	27
🎓 Dual Degrees	6
Total	377



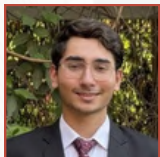
CONVOCATION AWARDS 2025



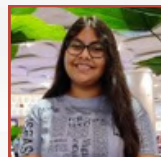
Shobhit Sharma (B.Tech/EE)
Dr. Elizabeth and Dr. Varkey Cherian
Award
Proficiency Prizes/Medals



Dhruv Misra (B.Tech/EE)
Director's Gold Medal (4-year UG
program), DRG Allrounder Award
IITK Excellence for Leadership in Students
Affairs



Hamza Masood (B.Tech/EE)
General Proficiency Medals
Prof. Samares Kar Memorial Gold Medal



Anushree Chaudhary (B.Tech/EE)
The E. Kerala Varma Raja Award



Aravind Seshadri (B.Tech/EE)
Dr. Prateek Mishra Memorial Gold Medal



Mansi Kumawat (MSR/EE)
Dr. Chandrakanta Kesavan Best
Research Thesis Award



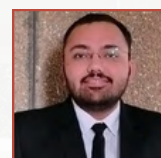
Amay Raj (B.Tech/EE)
IITK Excellence in Community Services



Challagulla Baala Krishhna (M.Tech/EE)
Silver Medal for Excellence in Education by
Sitaram Jindal Foundation



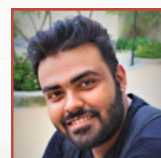
Manish Kumar Gupta (MSR/EE)
Dr. Chandrakanta Kesavan Best
Research Thesis Award
SIIC Student Innovation Award (SSIA)



Yojan Sharma (M.Tech/EE)
IEEE/ PEDES' 96 Award



CHETHAN R (M.Tech/EE)
Dr. Vijay K. Varma Talent Award



Swetaki Chatterjee (PhD/EE)
Outstanding Ph.D. Thesis Award



Meesam Jafri (PhD/EE)
Karandikar Best Ph.D. Thesis Award



Anirban Kar (PhD/EE)
Outstanding Ph.D. Thesis Award



Akash Kumar (M. Tech/EE)
Prof. L.P. Singh Power System Research
Award



Atul Kumar Soni (PhD/EE)
Outstanding Ph.D. Thesis Award



GALLERY 58th Convocation





5-Year Data (2020–2025)



Completed projects - 181
Total Funding- 152.16 cr



Number of Publications- 1448



Number of Patents Filed- 95

January - June 2025 Data



On going projects- 114
Total Funding- 79.52 cr



Sanctioned project- 31
Amount sanctioned- 99.43 cr



Number of Publications- 99



Number of Patents Filed- 8



PATENTS FILED (JANUARY - JUNE 2025)

Patents

S.No.	Details of Patents	Filed on
1	Mr. Saksham Gupta (B.Tech Student, EE), Dr. Sai Prasad Pydi (BSBE), Mr. Arijit Bhattacharjee (Senior Program Officer, SIB SHInE), Mr. Shivam Gupta (B.Tech Student, ME)	28.02.2025
2	Dr. Amar Kumar Behera (Design, IITK), Mr. Piyush Raj (B.Tech Student, ME), Mr. Nitish Kumar (B. Tech Student, ME), Mr. Sarthak Agarwal (B.Tech Student, EE), Mr. Siddhant Singh (B.Tech Student, ME), Mr. Sujeet Kumar (B.Tech Student, ME)	17.03.2025
3	Dr. Deepak Khare (Post-Doctoral Fellow, MSE), Dr. Priya Singh (Post-Doctoral Fellow, MSE), Mr. Murli Manohar (PhD Student, MSE), Dr. AbdulRahim Siddiqui (Post-Doctoral Fellow, King Abdullah University of Science and Technology), Dr. Supriya Das (Project Executive Officer, Gangwal School of Medical Science and Technology), Mr. Rushit Mansukhbhai Bhandari (Project Executive Officer, Gangwal School of Medical Science and Technology), Mr. Akshay Namdeo (Senior Project Engineer, Gangwal School of Medical Science and Technology), Mr. Vinay Kumar Tripathi (Senior Student Research Associate, Gangwal School of Medical Science and Technology), Mr. Abhishek Kumar (Project Engineer, Gangwal School of Medical Science and Technology), Mr. Phool Chand Gond (Project Technical officer, Gangwal School of Medical Science and Technology), Mr. Manoj Sharma (Senior Technical Superintendent, Department of Mechanical Engineering), Mr. Harindra Prashad Sharma (Project Technical officer, Gangwal School of Medical Science and Technology), Dr. Nikunj A. Bhagat (EE & BSBE), Dr. Amitabha Bandyopadhyay (BSBE), Dr. Pranav Joshi (ME), Dr. Jayandharan G.Rao (BSBE), Dr. Niraj Sinha (ME), Dr. K. Muralidhar (ME), Dr. Kantesh Balani (MSE)	31.03.2025
4	Dr. Nachiketa Tiwari (Professor, Design & ME, IITK), Mr. Vijay Kumar Pandey (Student, EE, IITK), Mr. Ateet Yadav (Student, Design, IITK), Mr. Kamal Sahu (Student, Design, IITK), Mr. Prajwal Subudhi (Student, ME, IITK), Mr. Divyansh Agrawal (Student, BS, IITK)	04.04.2025
5	Mr. Anirban Dey (PhD Student, EE), Dr. Parthasarathi Sensarma (EE)	06.05.2025
6	Mr. Sugandh Pratap Singh (PhD Scholar, EE), Mr. Pratik Sharma (Student, EE), Dr. Ankush Sharma (EE), Dr. Swathi Battula (EE)	22.05.2025
7	Dr. Amar Kumar Behera (Design), Mr. Atharv Jiwane (Student, ME), Ms. Ishita (Student, Economic Sciences), Ms. Jahnavi Singh (Student, BSBE), Mr. Mihir Gupta (Student, EE), Ms. Nikita Yadav (Student, CE), Ms. Shreya Verma (Student, Economic Sciences), Ms. Shreya Yadav (Student, BSBE)	30.05.2025
8	Dr. Amer Tabbakh (Post Doc, EE), Dr. Tushar Balasaheb Sandhan (EE)	10.06.2025



Publications

S.No.	Details of Publications
1	Nayak S.M.,Kothari M.,Sahoo S.R. ;Electromagnetic Refinement and Performance Characterization of a UAV BLDC Motor ; AIAA Science and Technology Forum and Exposition, AIAA SciTech Forum, 2025.
2	Nayak S.M.,Jaiswal R.,Kothari M.,Sahoo S.R. ;Design of Radial Flux Outer-Runner BLDC Motor for Single-Rotor UAVs ; AIAA Science and Technology Forum and Exposition, AIAA SciTech Forum, 2025.
3	Singh V.,Verma N.K. ;Variable feature weighted fuzzy k-means algorithm for high dimensional data ; Multimedia Tools and Applications, 2025.
4	Rituraj ,Yu Z.G.,Kandegedara R.M.E.B.,Fan S.,Krishnamurthy S. ;Highly sensitive and efficient 1550 nm photodetector for room temperature operation ; AIP Advances, 2025.
5	Jamdar A.M.,Rituraj ,Krishnamurthy S.,Bhallamudi V.P.,Krishnan S. ;Wavelength- agnostic metasurface design for next-generation 2D photodetectors ; Optics Express, 2025.
6	Heera B.S.,Singh Y.N.. ;Hybrid routing based RMSA algorithm for service delay aware applications in elastic optical networks ; Optik, 2025.
7	Guha B.,Mohapatra A.,Sahoo S.R.. ;Design of Price Functions Incorporating Line- Loss in Electricity Market using Cournot Model ; IEEE Transactions on Industry Applications, 2025.
8	Paul S.K.,Mohapatra A.,Das D.C.. ;Chance-constrained robust dynamic OPF in mutually coupled distribution networks with uncertain injections ; Optimization and Engineering, 2025.
9	Chaudhary R.,Sharma N.K.,Kala R.,Singh S.N.. "Deep Reinforcement Learning-Based Speed Predictor for Distributionally Robust Eco-Driving" <i>IEEE Access</i> , 2025.
10	Choudhary A.,Tahalyani J.,Akhtar M.J.. "Barium strontium titanate and exfoliated graphite nanocomposite integrated with frequency selective surface for enhanced radar absorption" <i>Materials Today Communications</i> , 2025.
11	Kumari T.,Suman K.K.,Gangwar R.K.,Chaudhary R.K.. "Al ₂ O ₃ Based Frequency Agile MIMO System with Beam Tilt Correction Using PLA Concave Parabolic Reflector" <i>IEEE Transactions on Dielectrics and Electrical Insulation</i> , 2025.
12	Pandey A.K.,Gangwar R.K.,Chaudhary R.K.. "A Compact Frog-Shaped Self-Diplexed MIMO Antenna with SD-HMSIW Technique for WLAN Applications" <i>IEEE Transactions on Antennas and Propagation</i> , 2025.
13	Mishra Y.,Rajoriya A.,Budhiraja R.. "Decentralized Learning Algorithm for Active User and Data Detection in mMTC CF mMIMO Systems" <i>IEEE Wireless Communications Letters</i> , 2025.
14	Singh A.,Hegde R.M.. "Age-Aware UAV-Aided Energy Harvesting for the Design of Wireless Rechargeable Mobile Networks" <i>IEEE Transactions on Artificial Intelligence</i> , 2025.
15	Mehrotra A.,Singh J.,Srivastava S.,Singh R.K.,Jagannatham A.K.,Hanzo L.. "Multi-dimensional Sparse CSI Acquisition for Hybrid mmWave MIMO OTFS Systems" <i>IEEE Transactions on Communications</i> , 2025.
16	Dwivedi S.,Sandhan T.,Pandey O.J.,Hegde R.M.. "swCNN: A Small World Convolutional Neural Network for Efficient Training" <i>Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics)</i> , 2025.
17	Landa T.R.,Sandhan T.. "Severity of Flood Damage Estimation from Aerial Scenery" <i>Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics)</i> , 2025.



Publications

S.No.	Details of Publications
18	Tyagi D., Sandhan T.. "Bandwise Attention in CycleGAN for Fructose Estimation from Hyperspectral Images" Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics), 2025.
19	Dwivedi S., Pandey K., Shubham K., Pandey O.J., Tripathi A.M., Sandhan T., Hegde R.M.. "MalaNet: A Small World Inspired Neural Network for Automated Malaria Diagnosis" IEEE Transactions on Artificial Intelligence, 2025.
20	Srivastava R., Kumar N., Sandhan T.. "Binary Classification of Laryngeal Images Utilising ResNet-50 CNN Architecture" Indian Journal of Otolaryngology and Head and Neck Surgery, 2025.
21	Tripathi S., Nizar F., Pandey O.J., Sandhan T., Hegde R.M.. "ENADL: Towards Performance Improvement of IoT Networks Using Deep Learning-Based Node Fault Prediction" IEEE Transactions on Reliability, 2025.
22	Heera B.S., Singh Y.N.. "Hybrid routing based RMSA algorithm for service delay aware applications in elastic optical networks" Optik, 2025.
23	Zarkob Y.H., Rajasekharan D., Pampori A., Sharma A., Pahwa G., Nandi D., Dabhi C.K., Kubrak V., Peddenpohl B., Tang M., Hu C., Chauhan Y.S.. "Impact Ionization in LDMOS Transistors: Improved Compact Model and Asymmetry under Forward and Reverse Modes of Operation" IEEE Journal of the Electron Devices Society, 2025.
24	Chakraborty A., Rafiq M., Zarkob Y.H., Chauhan Y.S., Sahay S.. "Ferroelectric FET-Based Bayesian Inference Engine for Disease Diagnosis" IEEE Transactions on Circuits and Systems I: Regular Papers, 2025.
25	Parihar S.S., Kumar S., Chatterjee S., Pahwa G., Chauhan Y.S., Amrouch H.. "Cryogenic Hyper-Dimensional In-Memory Computing using Ferroelectric TCAM" IEEE Journal on Exploratory Solid-State Computational Devices and Circuits, 2025.
26	Anil Kumar Panda H., Pandey G., Iyer S.S.K.. "Investigating Differences in Performances of top and Bottom Illuminated Organic Solar Cells" IEEE Journal of the Electron Devices Society, 2025.
27	Prakash D., Kamal N., Lahgere A.. "Comprehensive TCAD-Based Single Event Effect Study of TFET-Based 1T DRAM and Crossbar Memory Array" IEEE Transactions on Device and Materials Reliability, 2025.
28	Chowdhury S., Rituraj , Krishnamurthy S., Bhallamudi V.P.. "Resonant structure for improved directionality and extraction of single photons" JPhys Photonics, 2025.
29	Rituraj , Yu Z.G., Kandegedara R.M.E.B., Fan S., Krishnamurthy S.. "Highly sensitive and efficient 1550 nm photodetector for room temperature operation" AIP Advances, 2025.
30	Jamdar A.M., Rituraj , Krishnamurthy S., Bhallamudi V.P., Krishnan S.. "Wavelength-agnostic metasurface design for next-generation 2D photodetectors" Optics Express, 2025.
31	McAndrew C.C., Scholten A.J., Gullapalli K.K., Chauhan Y., Xia K.. "Benchmarks for SPICE Modeling and Parameter Extraction Based on AI/ML" IEEE Transactions on Electron Devices, 2025.
32	Mohmad Aasif Bhat and Imon Mondal, "An LPTV Programmable Bandpass True-time-Delay Line Without External Clock-Phase Shifter," in Proc. 2025 IEEE ISCAS, London, 2025.
33	P. Mukherjee, S. Mandal, K. R. Jerripothula, V. Maharshi, and K. Katara, "Multi-Fish Tracking with Underwater Image Enhancement by Deep Network in Marine Ecosystems," Signal Processing: Image Communication, Elsevier, 2025.
34	A.Gupta, K. R. Jerripothula, and T. Tillo, "CIRCOC: Co-saliency Inspired Referring Camouflaged Object Discovery," IEEE Winter Conference on Applications of Computer Vision (WACV), 2025.
35	P. Prakash, K. R. Jerripothula, A. J. Sam, P. K. Singh, and S. Umamaheswaran, "SymFace: Additional Facial Symmetry Loss for Deep Face Recognition," IEEE International Joint Conference on Neural Networks (IJCNN), 2025.



Publications

S.No.	Details of Publications
36	Prof. Shubham Sahay for his recent publication in Nature. His collaborative work with the Pennsylvania State University on demonstration of the world's first 2D CMOS-based computer
37	R Srivastava, YN Singh, V Lohani, "Bandwidth demand adaptive link weight aware OSNR based dynamic and hybrid routing, modulation, and spectrum allocation in multi-band multiplexed elastic optical networks" Optical Fiber Technology 93,104265
38	R Srivastava, YN Singh, V Lohani, A Sharma, BS Heera, "Requested bandwidth adaptive network state based adaptive routing and spectrum allocation algorithms in Elastic Optical Network" Optical Fiber Technology 93, 104243.
39	Ruchi Srivastava, Yatindra Nath Singh, "A novel fragmentation metric and fragmentation-aware adaptive routing and spectrum allocation algorithm in elastic optical network" Optical Fiber Technology, Volume 94, November 2025, 104318.
40	Subrahmanya Keremane Narayan and Rajshekhar Gannavarpu, Simultaneous estimation of multiple order phase derivatives using deep learning method in digital holographic interferometry, Optics and Lasers in Engineering, 184 (1), 108583, 2025.
41	G. Chaudhary, W. U. Mondal, and L. Behera, "MOORL: A Framework for Integrating Offline-Online Reinforcement Learning", Transactions on Machine Learning Research (TMLR), 2025.
42	S. Ganesh, W. U. Mondal, and V. Aggarwal, "A Sharper Global Convergence Analysis for Average Reward Reinforcement Learning via an Actor-Critic Approach", International Conference on Machine Learning (ICML), 2025.
43	S. Ganesh, J. Chen, W. U. Mondal, and V. Aggarwal, "Order-Optimal Global Convergence for Average Reward Actor-Critic with General Policy and Neural Critic Parametrization", Conference on Uncertainty in Artificial Intelligence (UAI), 2025.
44	S. Ganesh, W. U. Mondal, and V. Aggarwal, "Order-Optimal Regret with Novel Policy Gradient Approaches in Infinite Horizon Average Reward MDPs", International Conference on Artificial Intelligence and Statistics (AISTATS), 2025.
45	S. Chakrabarti, and W. U. Mondal, "Uplink NOMA-Aided Multi-Device Multi-Target Integrated Sensing and Communication", National Conference on Communications (NCC), 2025.
46	Subir Ghosh, Yikai Zheng, Musaib Rafiq, Harikrishnan Ravichandran, Yongwen Sun, Chen Chen, Mrinmoy Goswami, Najam U Sakib, Muhtasim UI Karim Sadaf, Andrew Pannone, Samriddha Ray, Joan M. Redwing, Yang Yang, Shubham Sahay & Saptarshi Das "A complementary two-dimensional material-based one instruction set computer" Nature, 642, pages327-335, 2025.
47	Bashir, M.Y., Sharma, P. and Sahay, S., 2025. 1 Transistor-Dynamic Random Access Memory as Synaptic Element for Online Learning. Advanced Intelligent Systems, p.2400912.
48	P. Sachan, A. Mahapatra, L. A. S. Channapragada, R. Kaur, Shubham Sahay and P. C. Mondal, Electrosynthesis of Molecular Memory Elements,RSC Chemical-Science, May 2025, DOI: 10.1039/D4SC08461F.
49	Musaib Rafiq, Yogesh Singh Chauhan, and Shubham Sahay, Exploiting drain-erase scheme in ferroelectric FETs for logic-in-memory, IoP Neuromorphic Computing and Engineering, vol. 5, no. 2, pp. 024007, 2025. DOI 10.1088/2634-4386/adce28.
50	Pradeep Sachan, Pritish Sharma, R. Kaur, D. Manna, Shubham Sahay and Prakash Chandra Mondal, Electrosynthesis of Ru (II)-Polypyridyl Oligomeric Films on ITO Electrode for Two Terminal Non-Volatile Memory Devices and Neuromorphic Computing, Small Methods,,p.2401911, 2025.
51	Tripta Kumari, Kundan Suman, Ravi K Gangwar, Raghvendra Kumar Chaudhary "AI2O3 Based Frequency Agile MIMO System with Beam Tilt Correction Using PLA Concave Parabolic Reflector" Accepted for Publication in IEEE Transactions on Dielectrics and Electrical Insulation, 2025.



Publications

S.No.	Details of Publications
52	Amit Kumar Pandey, Ravi K Gangwar, Raghvendra Kumar Chaudhary, "A Compact Frog-Shaped Self-Diplexed MIMO Antenna with SD-HMSIW Technique for WLAN Applications" Accepted for Publication in IEEE Transactions on Antennas and Propagation, 2025.
53	Amit Kumar Pandey, Ravi K Gangwar and Raghvendra Kumar Chaudhary, "A Compact SD-QMSIW-Based Self-Diplexing MIMO Antenna Using Two Modified L-Shaped Slots as Radiators for IoT Applications", IEEE Internet of Things Journal, Vol. 12 (3), pp. 2385 - 2394, 2025.
54	M. K. Srivastava, H. Gupta, N. Gupta, P. K. Agnihotri, and S. Basu, "Electromagnetic Shielding With CFRP Composites: Conducting Matrix Versus Conducting Fibers," Polymer Composites (2025): 1-12.
55	Gupta H, Agnihotri PK, Basu S, Gupta N. Carbon nanotube grafting for better electromagnetic shielding with carbon fiber/epoxy composites. Polym Compos. 2025; 1-11. doi:10.1002/pc.30003.
56	H. Gupta, M. Srivastava, P. K. Agnihotri, S. Basu and N. Gupta, "A Critical Assessment of Electrical Conductivity and Multifunctionality of MWCNT/Epoxy Nanocomposites," in IEEE Transactions on Dielectrics and Electrical Insulation, vol. 32, no. 3, pp. 1324-1332, June 2025, doi: 10.1109/TDEI.2025.3562536.
57	M. Moon Bordeori and N. Gupta, "Partial Discharge Activity During Electrical Tree Growth in Epoxy and Its Nanocomposites," in IEEE Transactions on Dielectrics and Electrical Insulation, vol. 32, no. 1, pp. 466-473, Feb. 2025.
58	S. Agarwal, KA Karuppusamy, Abhishek K Gupta, Exploring mitochondrial dynamics and localization under cellular stress: A comprehensive insight. J Biosci. 2025;50:23. PMID: 40202231.
59	Rashmi Kumari, Gourab Ghatak, Abhishek Gupta, Blockage Aware Placement of RIS in IIoT Networks, IEEE Annual International Symposium on Personal, Indoor and Mobile Radio Communications (PIMRC), 2025
60	Shuchi Tripathi, Abhishek Gupta, Can Blockages Improve Cognitive mmWave Networks with Directional Sensing and Communications? Proc. IEEE International Workshop on Signal Processing and Artificial Intelligence in Wireless Communications SPAWC, Surrey, UK.
61	Kaushlendra Pandey, H Dhillon, Abhishek Gupta, Load Distribution Analysis of Platooned Vehicular Networks on a Highway, Proc. IEEE International Workshop on Signal Processing and Artificial Intelligence in Wireless Communications SPAWC, Surrey, UK.
62	Muskan Ahuja, Abhishek Gupta, Performance of Ratio-Shift Keying Modulation for Diffusive Molecular Communication Scenarios, IEEE WCNC, March 2025, Milan, Italy,
63	Aravind M, Abhishek Gupta, Optimal Transmission Sequence Design With ISI Matching in Molecular Communication, NCC, IIT Delhi, Feb 2025.
64	Tamoghno Nath, Krishna Gopal Benerjee and Adrish Banerjee, "On Designing Novel ISI-Reducing Single Error Correcting Codes in an MCvD System," in IEEE Transactions on Molecular, Biological, and Multi-Scale Communications, vol. 11, no. 2, pp. 228-233, June 2025, doi: 10.1109/TMBMC.2025.3544137.
65	Tamoghno Nath, Krishna Gopal Benerjee, and Adrish Banerjee, "ISI-Aware Code Design: A Linear Approach Towards Reliable Molecular Communication," in IEEE Transactions on Molecular, Biological, and Multi-Scale Communications, Early Access, June 2025, doi: 10.1109/TMBMC.2025.3583543.
66	Tamoghno Nath and Adrish Banerjee, "A Novel Approach to ISI Mitigation in Diffusion-Based Molecular Communication: Optimizing Hybrid Symbol Time Interval," 2025 National Conference on Communications (NCC), New Delhi, India, 2025, pp. 1-6, doi: 10.1109/NCC63735.2025.10982960.
67	Shibsankar Das and Adrish Banerjee, "Mates of Cross Z-Complementary Pairs for Channel Estimation in Generalized SM-MIMO System," ICASSP 2025 - 2025 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), Hyderabad, India, 2025, pp. 1-5, doi: 10.1109/ICASSP49660.2025.10889689.



Publications

S.No.	Details of Publications
68	Shubham Srivastava, Krishna Gopal Benerjee, and Adrish Banerjee, "NEURON-IDS: One-Shot Neural Error Correction for DNA Storage Sequences," in the Proceedings of the 2025 IEEE International Conference on Machine Learning for Communication and Networking (ICMLCN), Barcelona, Spain 2025.
69	Krishna Gopal Benerjee and Adrish Banerjee, "Homopolymer-Free Constant Weighted Sum Sequences: Code Rate and Applications to DNA Codes," in Proceedings of the 2025 IEEE International Conference on Communications (ICC), Montreal, Canada 2025.
70	Krishna Gopal Benerjee and Adrish Banerjee, "Single Edit Error-Correcting DNA Codes With Multiple Biological and Combinatorial Constraints: an Algebraic Approach", in Proc. 2025 IEEE Symposium on Information Theory, Michigan, USA.
71	Tamoghno Nath, Krishna Gopal Benerjee, and Adrish Banerjee, "Improved Performance With (α, β) Constrained Transmission: a Family of High-Rate Codes for Molecular Communication via Diffusion", in Proc. 2025 IEEE Symposium on Information Theory, Michigan, USA.
72	Fluctuation-Mediated Spin-Orbit Torque Enhancement in the Noncollinear Antiferromagnet $\text{Mn}_3\text{Ni}_0.35\text{Cu}_0.65\text{N}$. Arnab Bose, Tom G Saunderson, Aga Shahee, Lichuan Zhang, Tetsuya Hajiri, Adithya Rajan, Durgesh Kumar, Dongwook Go, Hidefumi Asano, Udo Schwingenschlögl, Aurelien Manchon, Yuriy Mokrousov, Mathias Kläui. Nano Letters 25 (20), 8073-8079 (2025).
73	Harnessing orbital Hall effect in spin-orbit torque MRAM. Rahul Gupta, Chloé Bouard, Fabian Kammerbauer, J Omar Ledesma-Martin, Arnab Bose, Iryna Kononenko, Sylvain Martin, Perrine Usé, Gerhard Jakob, Marc Drouard, Mathias Kläui. Nature Communications 16 (1), 130 (2025).
74	Mudasir Ahmad Sheikh and Rohit Budhiraja, "Correlated Block Sparse Channel Estimation and Phase Optimization in RIS-OTFS Systems, IEEE Transactions on Wireless Communications, to appear.
75	Sauradeep Dey, Tejesh Kodeboina, Aritra Roy, and Rohit Budhiraja, "Dual-Polarized Multi-Cell Massive MIMO IRS Systems: SE Analysis, Low-Complexity Power and Deep-Phase Optimization, IEEE Transactions on Wireless Communications, to appear.
76	Suman Malik, Jyotirmay Saini, Dheeraj Naidu Amudala and Rohit Budhiraja, "Coverage Analysis and Enhancement Techniques for Ambient IoT Technology , IEEE Communications Standards Magazine, to appear.
77	M Rakesh, Dheeraj Naidu Amudala, and Rohit Budhiraja, "IRS-Aided Multi-Cell Massive MIMO Systems With Impairments: SE Analysis and Optimization , IEEE Transactions on Communications, to appear.
78	Sauradeep Dey, Vaishnavi Gonuguntla and Rohit Budhiraja, " WIPT-Enabled Massive MIMO URLLC Relaying: Hardware Distortion Aware SE Analysis And Low-Complexity Optimization, IEEE Transactions on Green Communications, to appear.
79	Mudasir Ahmad Sheikh, Anupama Rajoriya, Prem Singh, Rohit Budhiraja, "Bayesian Learning-Aided Channel Estimators for Superimposed-Pilot Based OTFS Systems, IEEE Transactions on Communications, vol. 73, pp 950 - 967, Feb. 2025.
80	Rakesh Mungala, Dheeraj Naidu Amudala and Rohit Budhiraja, "Multi-cell mMIMO IRS Systems With Impairments and Aging: Phase Optimization and Receiver Design, IEEE WCNC 2024, Milan Italy.
81	Tulika Garg, Anupama Rajoriya and Rohit Budhiraja, " Hardware Impairments Aware Bayesian Learning Channel Estimator for mmWave Wireless Systems, IEEE WCNC 2024, Milan Italy.
82	Athar Nazir Sofi, Dheeraj Naidu Amudala, and Rohit Budhiraja, "Low-Complexity Stochastic Power Control for UAV-Aided Multi-Cell mMIMO NOMA Systems, IEEE WCNC 2024, Milan Italy.
83	Sourasis Chatterjee, Sauradeep Dey, Rohit Budhiraja, "A Novel RSMA-PIC Protocol for Massive MIMO Relaying Systems and its WSEE Optimization, IEEE WCNC 2024, Milan Italy.



Publications

S.No.	Details of Publications
84	P Ranjit, M Gupta, J von Gillern, V Yetrintala, V Arora, "Adaptive Refiner Based Few-Shot Font Generation", Intl. Conf. on Pattern Recognition, Dec 2024.
85	P Singh, A Mishra, A Raina, V Arora, "Ontology-Driven Hierarchical Learning for Raga Identification", NCC, 2025.
86	SK Shruthi, N Ravi, V Arora, "BADCH: Backtracking and Adaptive chunking for Longform speech recognition", NCC, 2025.
87	A Singh, K Demuynck, V Arora, "BEST-STD: Bidirectional Mamba-Enhanced Speech Tokenization for Spoken Term Detection", IEEE ICASSP, 2025.
88	S Kumar, P Singh, V Arora, "Confidence-Enhanced Models for Indian Art Music Analysis", IEEE ICASSP, WiMAGA workshop, 2025.
89	P Singh, V Arora, "Explainable deep learning analysis for raga identification in indian art music", IEEE Trans. Audio, Speech and Lang. Process., 2025.
90	A Singh, YPP Chen, V Arora, "H-QuEST: Accelerating Query-by-Example Spoken Term Detection with Hierarchical Indexing", INTERSPEECH, 2025.
91	A Singh, K Demuynck, V Arora, "Language-Agnostic Speech Tokenizer for Spoken Term Detection with Efficient Retrieval", INTERSPEECH, 2025.
92	N Ravi, T Raj, RT Chaganti, V Arora, "ASR Confidence Estimation using True Class Lexical Similarity Score", INTERSPEECH, 2025.
93	RB Kodag, V Arora, "Meta-learning-based percussion transcription and identification from low-resource audio", IEEE Trans. Audio, Speech and Lang. Process., 2025.
94	J.Filipovic, A. Kundu, N. K. Vij, S. Fécherolle, A. Lemaître, S. Gupta, and O. Krebs, "Coherent spectroscopy of a single Mn-doped InGaAs quantum dot" Phys. Rev. B 111, 165302 (2025). [selected as editor's suggestion]
95	M. H. Ansari, S. Thakur, N. Bajpai, P. Maity, A. Lahgere, S. A. Ahsan, M. Shah, Y. S. Chauhan, "Comprehensive analysis and investigation of GaN LNA for 3-4 GHz using different gate-drain spacing", Microelectronic Engineering, 2025.
96	Hemadri Bandhu, and Amit Verma, "Dynamic color switching in direct laser written Vanadium dioxide patterns", _Optics and Laser Technology_ 191, 113289 (2025).
97	Modassir Anwer and Amit Verma, "LPCVD grown n-type doped β -Ga ₂ O ₃ films on c-plane sapphire using TEOS precursor", _Materials Science in Semiconductor Processing_ 197, 109697 (2025).
98	Yogitha S N, Nityananda Acharyya, Abhishek Mishra, Mangababu Akkanaboina, Amit Verma, Dhanvir Singh Rana, and Dibakar Roy Chowdhury, "Thermally tunable dual channel toroidal metasurface on VO ₂ platform", _J. Appl. Phys._ 137, 193105 (2025).
99	Hemadri Bandhu and Amit Verma, "Reconfigurable Infrared (IR) Emissivity of VO ₂ Patterns Fabricated via Maskless Laser Writing for Adaptive IR Applications", _ACS Applied_ _Optical Materials_ 3, 1162 (2025).



PROJECTS SANCTIONED (JANUARY - JUNE 2025)

Projects

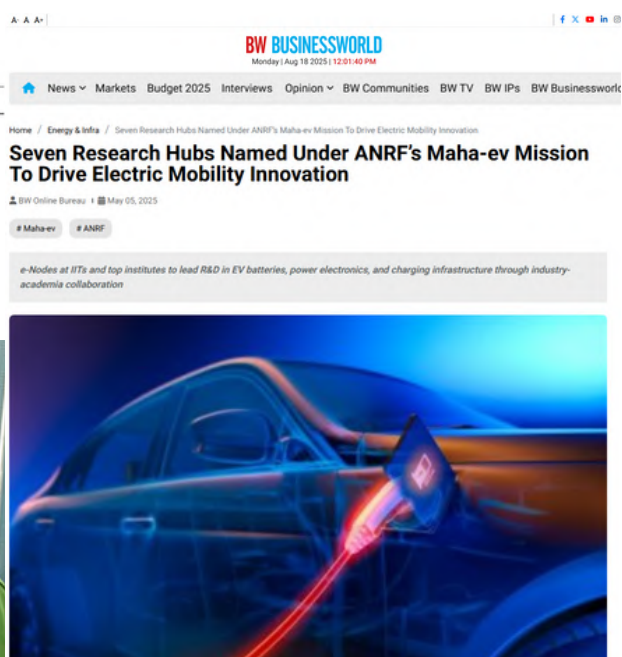
S.No.	Principal Investigator	Co Principal Investigator	Project Title
1	Abheejeet Mohapatra	Ankush Sharma	Relay Setting Validation(132/33 Kv Rss,750vdc Tss Ass Detailed Study Of Protection System Of Mpmrcl
2	Ketan Rajawat		Development Of Uav Solutions For Agricultural Use
3	Ebin Cherian Mathew	Saikat Chakrabarti	Development Of Equipment Model Library To Facilitate Operational Engineering And Research Studies Of Re Rich Power System
4	Ankush Sharma		Development Of An App/Portal For Feeding The Mobile Number Of Line Man And Adding Sim Based Data Communication From The Switch Guard Devices
5	Utsab Kundu		Analog Implementation Of Closed-Loop Control Techniques For Synchronous Buck Converter
6	Yogesh Singh Chauhan	Avinash Lahgere	Quantum Computing - Design and Demonstration of a Highly Scalable Quantum Computer using Semiconductor Qubits
7	Gururaj Mirle Vishwanath		Proposal For Street Lights And Ayodhya Solar Smart City Inspection
8	Gururaj Mirle Vishwanath	Amarendra Edpuganti	Design, Development, Fabrication, Testing And Integration Of Smart Energy Management System (Ems) For Hybrid Micro-Grid And Scale Energy Storage Applications
9	Piyush Kant		Design And Development Of High-Power Density Solid-State Transformer Based Medium Voltage (11 Kv) Grid Connected Ev Charging Station With Dc-Fast Charger And Renewable Energy Integration
10	Ankush Sharma		Exploratory Research On Microgrid Controller With lit Kanpur
11	Kumar Vaibhav Srivastava	A R Harish	Antenna Element Design For A Shared Aperture Array For Sand X Band Radar Application
12	Tushar Balasaheb Sandhan		Ai And Deep Learning Based Prototype Development For Wheat Grains
13	Avinash Lahgere	Yogesh Singh Chauhan	Cryo-Cmos Pdk Enablement For Semiconducting Qubit : Cryogenic Probe Station (CARE Grant 2025)
14	Parthasarathi Sensarma		Ac-Dc Converter For Configurable Ev Charger
15	Utsab Kundu		Empowering Research In Indigenous Development Of Ev Sub-Systems (E-Rides)
16	Utsab Kundu	Parthasarathi Sensarma	Dc-Dc Converter For Configurable Ev Charger
17	Ankush Sharma	Vinay Kumar Tiwari	Third Party Quality Inspection Of Electrical Works(Lt Side & Substation) Of "Under Construction 500 Bedded Super Specialty Hospital Block At Saifai, Etawah
18	Rajshekhhar Gannavarpu	Ketan Rajawat	Development Of Machine Learning Assisted Quantitative Phase Microscopy Technique For Lable-Free Cell Imaging



PROJECTS SANCTIONED (JANUARY - JUNE 2025)

Projects

S.No.	Principal Investigator	Co Principal Investigator	Project Title
19	Saikat Chakrabarti	Abheejeet Mohapatra	(1) Grid Readiness For Ev : Enablers And Technological Developments (Greet)
20	Saikat Chakrabarti	Abheejeet Mohapatra	(2) Grid Readiness For Ev : Enablers And Technological Developments
21	Arnab Bose		Harnessing Orbital Current In Transition Metals For Efficient Manipulation Of Nanomagnets
22	Ebin Cherian Mathew		Design And Development Of Modular E-Statcom With Grid-Forming Capabilities
23	Utsab Kundu		Emi Performance And Efficiency Optimization Of On-Board Battery Charges For Electric Scooters
24	Koteswar Rao Jerripothula		Vider-Blinks : Video-Based Diagnosis And Rehabilitation Of Bell'S Palsy And Blepharospasm Via Blinks
25	Washim Uddin Mondal		Distributionally Robust Constrained Reinforcement Learning With Function Approximation
26	Rajesh Mahanand Hegde		Use Case Validation Of Cpu-Based Ai Inference Platform For Audio- Based Applications : Sanskrit Language Transcription
27	Rajesh Mahanand Hegde		Enhancing Interoperability For Scalable And Reliable Edge Computing Ecosystem In The Internet Of Things
28	Saikat Chakrabarti	Vinay Kumar Tiwari	Vetting Of Electrical Design And Drawing Of Interim Terminal Building Aai At Purnea Bihar
29	Kumar Vaibhav Srivastava	Janakarajan Ramkumar	Active Tunable Electromagnetic Structures
30	Nagarjuna Nallam		Initiation Grant
31	Md. Jaleel Akhtar		Transforming India'S Digital Landscape: Harnessing Reconfigurable Intelligent Surfaces For Enhanced Connectivity And Sustainability



Partner Institutions



Industry Partners



List of PIs

S. No.	Title	Name	Designation
1	Dr.	Abheejeet Mohapatra	Associate Professor
2	Dr.	Ankush Sharma	Associate Professor
3	Dr.	Suvendu Samanta	Assistant Professor
4	Dr.	Amarendra Edpuganti	Assistant Professor
5	Dr.	Gururaj M. V.	Assistant Professor
6	Dr.	Piyush Kant	Assistant Professor

S. No.	Title	Name	Designation
7	Dr.	Swathi Battula	Assistant Professor
8	Dr.	Ebin Cherian Mathew	Assistant Professor
9	Dr.	Prabodh Bajpai	Professor
10	Dr.	S. R. Sahoo	Associate Professor
11	Dr.	Abhilash Patel	Assistant Professor
12	Mr.	Shiv Kumar Singh	Research Establishment Officer



ALUMNI RECOGNITION (JANUARY - JUNE 2025)



Prof. Pankaj Jalote (BT/EE/1980)

2025 Distinguished Academic
Achievement Alumni Award



Dr. Ajay Kumar (BT/EE/1984)

Appointed as Chairman of Union
Public Service Commission



Mr. Sandeep Fuller (BT/EE/1986)

Appointed as CEO – Systems &
PMC at SYSTRA



**Prof. Rajiv K. Varma (BT/PhD/EE/
1980/1988)**

Named IEEE Fellow



Dr. Nilesh Pandey (PhD/EE/2022)

Awarded the prestigious IEEE-
EDS 2024 Early Career Award



Mr. Amit Agrawal (BT/EE/1991)

Appointed as Secretary of
Department of Pharmaceuticals



Mr. Saikat Guha (BT/EE/2002)

Named as IEEE Fellow Class of
2025



Dr. Inder Monga (BT/EE/1990)

Featured on the cover of
EdgeDiscovery 2025



STUDENTS AWARDS (JANUARY - JUNE 2025)



Baisakhi Bandyopadhyay (PhD/EE)

IEEE MTT-S Graduate Fellowship for 2025 at the IEEE International Microwave Symposium (IMS)

Under the guidance of Prof. Kumar Vaibhav Srivastava



Mantavya Upadhyay (B.Tech/EE)

Best Poster Award at 2nd Global Conference on Decarbonizing India

Under the guidance of Prof. Rajeev Jindal



Shailendra Pratap Singh (PhD/EE)

Best Paper Award at 2025 IEEE 1st International Conference on Smart and Sustainable Development in Electrical Engineering (SSDEE)

Under the guidance of Prof. Ramprasad Potluri



Atul Kumar Soni (PhD/EE)

Clayton Griffin Student Paper Award 2025

Under the guidance of Prof. Abheejeet Mohapatra and Prof. S N Singh



Shreya Pourush (PhD/EE)

IEEE Antennas and Propagation Society (AP-S) C.J. Reddy Travel Grant

Under the guidance of Prof. Raghvendra Kumar Chaudhary



Abhishek Bhardwaj (B.Tech/EE)

Hyundai Hope Scholarship for developing "Advanced AI-Driven Headset for Visually Impaired People"

Under the guidance of Prof. Amar Behera



Basil M. Idrees (PhD/EE)

Best Student Presentation Award at the Photonics and Electromagnetics Research Symposium (PIERS) 2025 Abu Dhabi

Under the guidance of Prof. Ketan Rajawat

EE ALUMNI REUNION



EE Department hosted a get-together for the Class of 1989.



EE Department hosted a get-together for the Class of 2014.



EE Department hosted a get-together for the Class of 1965.



EE Department hosted a get-together for the Class of 1985.



EE Department hosted a get-together for the Class of 1975.



EE Department hosted a get-together for the Class of 1980.

GALLERY



Prof. Srabanti Chowdhury, Stanford University, delivered an IEEE EDS talk on 'Wide bandgap devices' during her visit to the Dept. of Electrical Engineering, IIT Kanpur.



Prof. William G. Whittow from the Wolfson School of Mechanical, Electrical, and Manufacturing Engineering, Loughborough University, delivered a lecture on "Recent Advances in Reconfigurable RF Frontend Systems."



A bonfire evening organized by the Electrical Engineering Association (EEA) to enhance the student-faculty interaction.



Prof. Stefan Wiefels from the Forschungszentrum Jülich, Germany delivered a lecture on " VCM-type ReRAM (OxRAM) Devices and Reliability Aspects "



Mr. Milind Dighrasker, Senior Director, ON Semiconductor, delivered a lecture on "Overview of Design Challenges for SiC-based Traction Inverters"



Prof. Akhilesh Jaiswal from the University of Wisconsin-Madison, USA delivered a lecture on "Unconventional Computing Paradigms from Extreme-Edge to Extreme-Scale"



Prof. Saurabh Lodha, IIT Bombay, delivered a lecture on "Engineering the strain and neuromorphic performance of 2D-TMD transistors" as a part of the "Narayan Murthy Lecture Series"



Prof. Souvik Mahapatra, IIT Bombay, delivered a lecture on "A Device (TCAD) to Circuit (SPICE) Framework for BTI and HCD Aging" as a part of the "K R Sharma and Dr. M. Ramamoorthy Distinguished Lecture Series"



NEW POSTGRADUATE STUDENTS 2024-25 (Semester -II), IIT Kanpur.



The electrical engineering association organized a fun filled happy hour for its UG students on 24th march 2025 to enrich student-faculty association.

GALLERY



IIT Kanpur's Department of Electrical Engineering is grateful to Prof. Animesh Biswas for his devoted years of service, priceless contributions, and enduring influence on the department and its community.



Pioneering Research & Innovation Award 2025 Prof. Tushar Sandhan becomes the first recipient, leading excellence at the Perception & Intelligence Lab, EE Dept., IIT Kanpur.



The Electrical Engineering Association organized Farewell 2025 to mark this significant milestone for the Department of Electrical Engineering students.



Y21 UG graduating batch of the Electrical Engineering Department gathers for a group photograph.



NEWSLETTER DEPARTMENT OF ELECTRICAL ENGINEERING

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