



IIEST, Shibpur



From HoD's Desk

Dear All,

*I am proud to share the **Third** edition of the newsletter "Bidyut" of the Department of Electrical Engineering. In today's fast-paced digital age, newsletters are more than just a summary of updates. They are powerful tools that help brands connect with their audience, convey their story, and drive engagement.*

The Department of Electrical Engineering was established in the year 1912. The department offers an 8-semester undergraduate B. Tech. course, a 10-semester dual degree (B. Tech. and M. Tech.) course and 4-semester postgraduate M. Tech. degree course in Electrical Engineering. The department also offers research programs leading to a Ph.D. degree. It produced its first batch of graduate electrical engineers in 1936. The postgraduate degree was first offered in 1955 and the first Ph.D. Scholar from the department came out in 1959. The major M. Tech. Specialisations are Control and Industrial Automation, Power and Energy Systems and Power Electronics, Machines & Drives.

Post-independence, when the nascent nation had just started building the power plants that have been instrumental in realizing the dreams of modern India, many of the visionaries, planners and implementers were the students of this department. The present focus of the department is to include several modern topics in its UG/PG curricula and to focus on the cutting edge research in line with the need of our mother land.

This version of the Newsletter includes major events and programs, Sponsored research projects, Invited Talks, Research Collaboration, Consultancy Projects, Patents, Journal and Conference publications, and Student activities.

I look forward more and more contribution from all stakeholders and more eventful version of newsletter ahead.

Thanks and regards,

Prof. Aparajita Sengupta

Events & Programs

• Seminar/ Symposium Organized

1) ANRF supported National Workshop on 'Intelligent Embedded Controllers - The Way Forward (IEC-2025)" from 8th July - 12th July, 2025 was conducted by Prof.(Dr.)Suvarun Dalapati, Prof.Debjani Ganguly and Dr.Anirudh Nath.



2)A Workshop was organized on Integrating HPC, SLURM, CUDA, and Cybersecurity for AI in Power Utilities - A Workshop (IHSCCP-2025) during 14th - 19th July, 2025 in the Seminar Room of Electrical Engineering Department of IEST Shibpur by Dr. Amal Barman, Prof. Kanika Das Bhattacharya, Dr. Reetam Modal and Dr. S. A. Qasim.



Events & Programs

• Seminar/ Symposium Organized

3) A Short Term Training Programme on Applied Control & Industrial Automation (ACIA-2025), technically sponsored by IET, Kolkata local chapter was organized during 26th - 30th Aug, 2025 in the Seminar Room of Electrical Engineering Department of IEST Shibpur by Dr. Reetam Mondal, Dr. Roshni Maiti and Dr. S. A. Qasim.



• Upcoming Events

1) Prof.(Dr.)Kaushik Mukherjee will assist a lecture series entitled, 'Legends and Legacies', with the help of the Alumni Association of IEST Shibpur, GAABESU in November 2025.

2) Prof.(Dr.)Atanu Banerjee will be an organizer of the Indian Engineering Congress (IEC) to be held in the Department of Electrical Engineering (EE), IEST Shibpur, during 15-16th, November, 2025.

Events & Programs

- **Invited Talk Conducted**

1) Prof. Bhaskaran Barman organized an invited talk on The 4-R Framework in Energy Resilience (Robustness, Redundancy, Response, Recovery) by Dr. Malabika Basu, on 1st August, 2025.

2) Prof. Bhaskaran Barman organized an invited talk on LV & MV AC Induction Motor Product Portfolio by Marathon Electric Motors (India) Limited, on 27th August, 2025.

3) Prof. Bhaskaran Barman organized an invited talk on Innovating the Next-generation Electric Vehicle Systems and Subsystems for Reduced Cost and Improved Performance. by Dr. Narayan Kar, on 28th August, 2025.

4) Prof. (Dr.) Kaushik Mukherjee organized a Technical lecture entitled, "Active Mitigation of Power Ripple in Single-Phase Conversion: Design for Compactness and Reliability", arranged on 25.07.2025 jointly by IEST EE Department and IEEE IAS Kolkata Chapter (Speaker: Dr. Sujata Bhowmick, Research Associate, PhD and M.Tech from IISc Bangalore).

5) Prof. (Dr.) Debabrata Roy as one of the Program Coordinators of an IIC 7.0 event: Invited talk on "Key trends in cutting-edge technology fields including AI, robotics, and digital manufacturing" by Dr. Stephen Ezell on 8th August, 2025 in the Department of Electrical Engineering

6) Prof. (Dr.) Debabrata Roy organized (as President of IIC 7.0) a workshop on "Innovations in Elementary Education" in the Department of Electrical Engineering on 22nd August, 2025.



Invited Talks Delivered

1)Prof.(Dr.)Suvarun Dalapati has delivered an lecture on Power Electronics: Converters and Applications; Embedded Control of Electrical Systems.

2)Prof.(Dr.)Mousumi Mukherjee has delivered an invited lecture and hands-on session on "Data-driven Control" for an Online Faculty Development Programme on Advances in Control Engineering (ACE-2025), at NIT Patna, during 21st to 28th July, 2025.

3)Prof.(Dr.)Mousumi Mukherjee has delivered a talk in the Symposium on recent trends in Control and Computing, at IIT Bombay, during 16th - 17th April, 2025.

4)Prof.(Dr.)Moushumi Mukherjee has delivered attended a GIAN course on Data-Driven Learning of Dynamics for Control with Applications to Robotics and Power Systems at IIT Madras during 1st to 7th July, 2025.

5)Prof.(Dr.)Kaushik Mukherjee has delivered a talk on Electrical Machines, Electrical Drives, Power Electronics.

6)Prof.(Dr.)Aparajita Sengupta has delivered a technical Lecture Delivered in Short Term Training Program-me (STTP) on Applied Control & Industrial Automation (ACIA) 2025, IEST, Shibpur

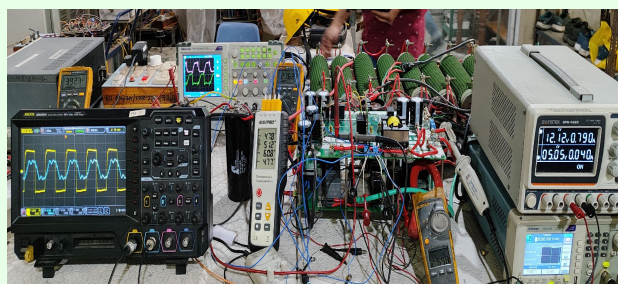
Ongoing Research Activities



Implementation of a Data Driven Controller on Rotary Servo Flexible Link System interfaced with SIMULINK Real Time Workshop



Experimental Setup of the single-axis controlled repulsive-type magnetic bearing



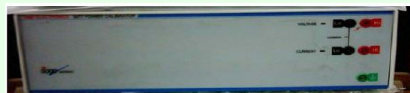
Experimentations in NaMPET project



Numerical Relay in the Power System Protection Lab



Experimental Set-up in Process Control & Instrumentation Laboratory



Single Phase Power Calibrator



Precision Multimeter



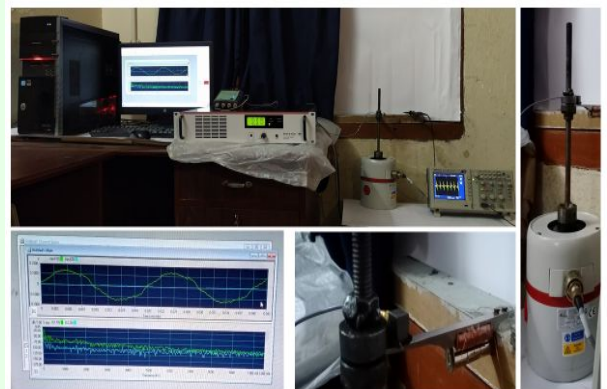
650° Dry Bath



DL1620 Digital Storage Oscilloscope



Pressure Calibrator



Experimental Setup of the Magnetostrictive Energy Harvester using Shaker and other accessories



Experimental Set-up in Smart Control System Laboratory (MAGLEV Plant)



Simulation Laboratory in Electrical Engineering

Sponsored Research Projects

Title: Going Remote – Solar Energy for Lighting and Hygienic Sanitation with Smart Exhaust system for Rural Applications

- **Investigators:** Dr. Konika Das (Bhattacharya) & Dr. Chandan K. Chanda
- **Agency:** DST-TMD-CERI

Title: Design and development of magnetic core power inductor (HF-Mag)

- **Investigator:** Dr. Mainak Sengupta
- **Co-PI:** Prof. Bhaskaran Barman
- **Agency:** MEITY

Title: Design and development of WBG device based high current converters for industry applications

- **Investigator:** Dr. Mainak Sengupta
- **Co-PI:** Prof. Bhaskaran Barman
- **Agency:** MEITY

Title: MEMS for electric machines and drives (MEMS Machines)

- **Investigator:** Dr. Mainak Sengupta
- **Agency:** MEITY

Title: Design and development of Multilevel Inverter based Distributed Power Flow Controller(DPFC) FACTS for a grid integrated system with renewable energy sources

- **Investigator:** Dr. Atanu Banerjee
- **Agency:** CPRI

Title: Data-driven methods in systems and control

- **Investigator:** Dr. Mousumi Mukherjee
- **Agency:** DST

Title: Design and Development of Ultrawideband Partial Discharge Sensors and Analysing Systems for Air and Gas Insulated Electrical Substations,

- **Investigator:** Dr. Sourav Dhara
- **Agency:** DST

Revenue Generation Avenues

- Consultancy Projects

Sl. No.	Name of the Investigator	Title of the project and duration (Start and end date)	Amount sanctioned
1.	Prof. Suvarun Dalapati	Design and Development of SMPS based Integrated Power Supply (IPS) for Indian Railways	Rs. 10,10,000 (+18% GST)
2.	Prof. Bhaskaran Barman	Preparation of R & R colony layout in Paschim Shibpur Mouza and estimation of existing household in Bastabpur Village (3 yrs)	Rs. 29,50,000
3.	Dr. S A Qasim	Technical Vetting / Approval of Design and Drawing for Ropeway at Naina Devi Ji Temple, Bilaspur, Himachal Pradesh (sanctioned on 23rd June, 2025)	Rs. 70,800

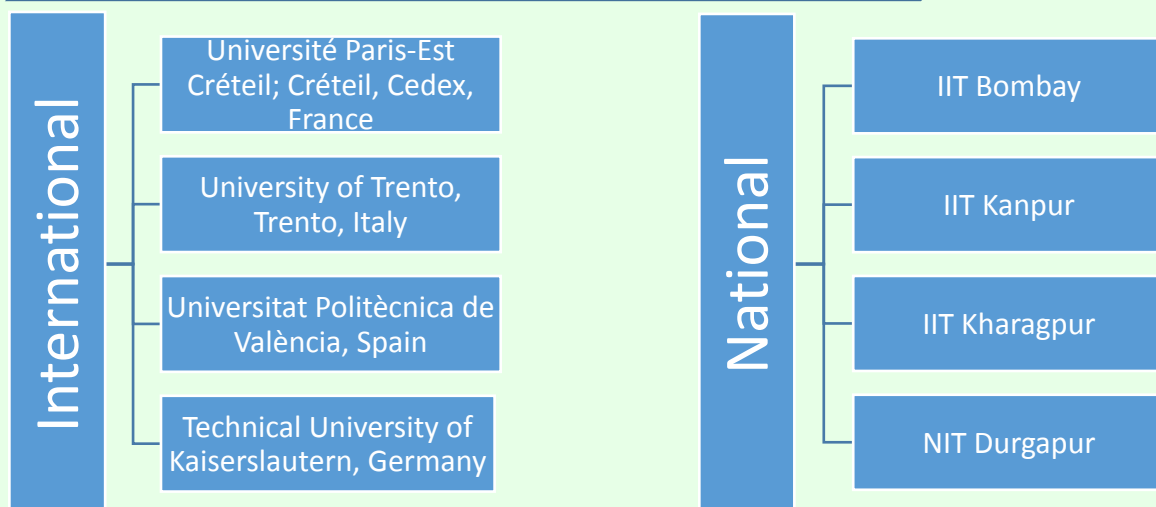
Research & Collaborations

PhD Thesis Submitted and Degree Awarded

PhD Thesis submitted / Degree Awarded

1. One PhD completed under the supervision of Prof. Sukanya Parui.
2. PhD thesis submitted by Ms. Debalina Nanda, research scholar under the supervision of Prof. Kaushik Mukherjee.
3. The scholar Mr. Subhankar Pusti, working under the supervision of Prof. Debabrata Roy and Prof. Tapan Santra submitted his thesis on 12.06.2025.
4. Two students submitted PhD thesis at NIT Meghalaya under the supervision of Prof. Atanu Banerjee.

International/ National collaborations



Journal Publications

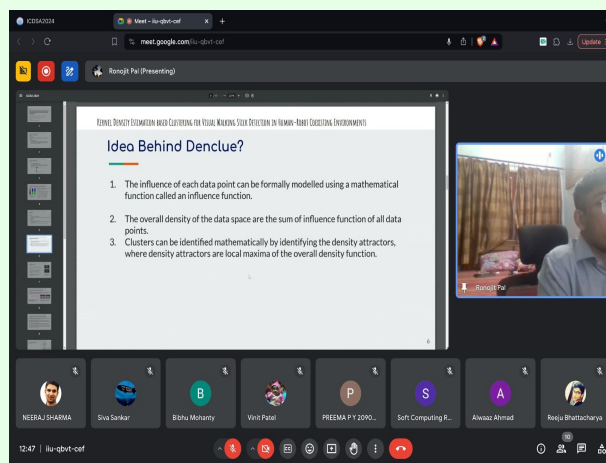
- ❖ Dipankar Chatterjee, Chandan Chakraborty and Suvarun Dalapati, "Current Sensor-Less Dead Time Distortion Compensation in Three-Phase PWM Inverter," in *IEEE Transactions on Power Electronics*, vol. 40, no. 9, pp. 12873-12892, Sept. 2025, doi: 10.1109/TPEL.2025.3569945.
- ❖ C. Dolui, S. Ray, N. Roy and D. Roy, "Magnetostrictive Sensor-Based Smart Monitoring System for Bridge Health Using Machine Learning", *IEEE Transactions on Circuits and Systems for Artificial Intelligence*, DOI: 10.1109/TCASAI.2025.3609275. (Accepted on September 7, 2025)
- ❖ Dipankar Chatterjee, Chandan Chakraborty and Suvarun Dalapati, "An Overview on Dead-Time Distortion and Its Correction in PWM Inverters," in *IEEE Open Journal of Power Electronics*, vol. 6, pp. 1453-1490, 2025, doi: 10.1109/OJPEL.2025.3600262.
- ❖ P. Yadav, J. Piri, A. Sengupta, M. Sengupta, "Q-Learning Based Adaptive Student's t Maximum Correntropy Cubature Kalman Filter for Non-Gaussian Noise with Unknown Noise Covariances," *International Journal of Adaptive Control and Signal Processing* (2025) – SCIE, IF: 3.8.
- ❖ P. Yadav and A. Sengupta, "Cluster-Aware and Feature-Guided Deep Learning Framework with Fusion Weighting for State of Health Prediction of Li-ion Batteries," *Ionics* (2025) – SCIE, IF: 2.6.
- ❖ A. Bandyopadhyay, K. Mandal, S. Parui, and S. K. Biswas, "Inherent Time Delay in Analog Controllers of Power Electronic Systems is a Harbinger of Different Types of Instabilities," *IEEE Transactions on Industry Applications*, 2025. doi: 10.1109/TIA.2025.3583681 (Early Access).
- ❖ P. Yadav, A. Dey, A. Sengupta, "Adaptive Multi-Kernel Maximum Correntropy Based Divided Difference Filter for Nonlinear State Estimation with Measurement Outliers and Unknown Noise Covariance," *International Journal of Systems Science* (2025) – SCIE, Q1, IF: 4.9.
- ❖ Shivanshu Kumar, Saikat Mondal, Amalendu Bikash Choudhury, Himadri Sekhar Bhattacharyya, Chandan Kumar Chanda, " Estimation of state of charge for a lithium-ion battery pack using nonlinear Kalman filters", *International Journal of Ionics*, Springer, Volume 31, pages 7953–7968, May 2025, doi: <https://doi.org/10.1007/s11581-025-06420-z>.
- ❖ P. Yadav, J. Piri, A. Sengupta, M. Sengupta, "Harmonics Estimation of Power Signals in Presence of Non-Gaussian and Non-Stationary Noise," *International Journal of Control* (2025) – SCIE, IF: 1.6.

Conference Publications

- ❖ Debanjan Dhara, Ranajay Paul, Suvarun Dalapati, Centrally Aligned Pulse Based One Cycle Control Technique for PWM Voltage Source Inverters, paper presented at IEEE North-East India International Energy Conversion Conference and Exhibition (NE-IECCE), 2025, held at NIT Silchar (4th - 6th July, 2025), 2025
- ❖ A. Bandyopadhyay, K. Mandal and S. Parui, "A Design Oriented Dynamical Perspective on Proportional-Resonant Controller with $1 - \Phi$ Inverter," 2025 IEEE North-East India International Energy Conversion Conference and Exhibition (NE-IECCE 2025), NIT Silchar, India, pp. 1-6, July 4-6, 2025.
- ❖ Shivanshu Kumar, Shisir Baran Jana, Dhruv Jhunjunwala, Amalendu Bikash Choudhury, "Accelerating Rate Calorimetry Test based Fault Analysis of EV Battery Packs" 2nd International Conference on Circuits, Power, and Intelligent Systems (CCPIS) 2025, Silicon University, Odisha, September 5-7, 2025
- ❖ Moyukh Mandal, K. Mukherjee, "A Transistorized DC Commutatorless Series Motor Drive with Reduced Torque Ripple for Electrified Vehicle Applications", published in IEEEExplore, 21.04.2025, presented in 2024 IEEE International Conference on Power Electronics, Drives and Energy Systems (PEDES), NIT Surathkal, December 2024.
- ❖ C. Dolui and D. Roy, "A Review on Machine Learning Techniques Applied to Magnetostrictive Sensor for Structural Health Monitoring", 1st International Conference on Energy, Environment, and Green Technology (ICEEGT 2025), Department of Electrical Engineering, NITTTR Kolkata, April 3-4, 2025.
- ❖ Subojit Dhar, Oindrila Biswas, Anweshdeep Ghosh and Abhinandan De, International Book Chapter "Optimal Placement of Capacitor Banks in Distributed Network for Improved Voltage Profile and Reduced Power Losses Using Particle Swarm Optimization", Proceedings of the International Conference on Data Analytics and Insights, Lecture Notes in Networks and Systems, vol 1233, Springer, Singapore, July 2025, pp 379–393. https://doi.org/10.1007/978-981-96-3287-9_30

Conference Publications

- ❖ Reēju Bhattacharya, Ronojit Pal, Pritam Paral, and Anindita Sengupta, “Kernel density estimation based clustering for visual walking stick detection in human-robot coexisting environments” in Data Science and Applications. ICDSA 2024. Lecture Notes in Networks and Systems, vol. 1237, Springer, Singapore, May 2025, pp. 151–164, DOI: https://doi.org/10.1007/978-981-96-1185-0_13.
- ❖ Saibal Ghosh, Pritam Paral, Pubali De, Amitava Chatterjee, and Sugata Munshi, “Multicolor multishape visual cue recognition using a hybrid approach of cosine similarity-based 2DLPP and granular computing” in Recent Advances in Artificial Intelligence and Smart Applications. RAAISA 2024. Lecture Notes in Networks and Systems, vol. 1380, Springer, Singapore, August 2025, pp. 469–482, DOI: https://doi.org/10.1007/978-981-96-5822-0_37.



Book Chapter Publications

- ❖ Sayantan Chakraborty, Pritam Paral, and Amitava Chatterjee, “Parameter sensitivity analysis for branch and bound algorithm based CFAsT-Match approach for shoe detection in collaborative robotics” in *Computational Intelligence and Data Analytics. ICCIDA 2024*. Lecture Notes on Data Engineering and Communications Technologies, vol. 236, A. C. Frery, R. Buyya, R. M. R. Kovvur, and T. H. Sarma, Eds., Singapore, Singapore : Springer Verlag, 2025, pp. 409-420, DOI: https://doi.org/10.1007/978-981-96-0451-7_30.
- ❖ Pritam Paral, Amitava Chatterjee, and Patrick Siarry, “Innovative applications of metaheuristics to supervised machine learning” in *Handbook of Heuristics*, R. Martí, P. M. Pardalos, and M. G. C. Resende, Eds., 2nd ed. Cham, Switzerland: Springer International Publishing, April 2025, pp. 1–30, DOI: https://doi.org/10.1007/978-3-319-07153-4_66-1.

Students' Activities & Achievements

Recent Achievements of Students

S. No	Name of Student	Course	Organisation
1	Atri Datta (7 th Sem B.Tech)	Rank 1379 in GATE 2025 (EE)	IEST
2	Deepak Garg (7 th Sem B.Tech EE)	- Rank 1539 in GATE 2025 (EE) - Won 1st Place in Soccred games event under Robocon	IEST
3	Ruman Paul (7 th Sem B.Tech EE)	Badminton Runner up at inter hall badminton Tournament, IEST Shibpur	IEST
4	Harsh Kumar Shah (7 th Sem B.Tech EE)	Volleyball Champion of Richardson Premium League and Wolfame	IEST
5	Sakshi Kailash pardhi (7 th Sem B.tech EE)	Participate in Fintech and Cyber Security Hackathon	UCO Bank
6	Supriyo Roy (7 th Sem B.Tech EE)	Certificate of Distinction in Winter School 2024	CeNSE, Indian Institute of Science (IISc)
7	Bideepta Acharya (7 th Sem B.tech EE)	Participate in Chandrayaan - 3 Mahaquiz	ISRO
8	Anay Verma (7 th Sem B.Tech EE)	- Won 3rd prize in electroquip organised under Sphuran - Won 1st Place in Soccred games event under Robocon	Electrical Engineers' Society Robodarshan Club
9	Harshit Kasera (7 th Sem B.tech EE)	- Selected for IHFC READY(Reasearch and Entrepreneurship) program - Selected For CBDE(Capacity Building on Design) program	IIT Delhi IEST
10	Avirup Ghosh, Sunnik Das (7 th Sem B.Tech)	Participated in National Level Competition and Demonstrated project on Electricity Theft Detection system	BITM SEF 2025
11	Utsa Prokash Biswas	Outstanding verdict from Mentor	CSIR CSIO
12	Rupanjana Bhattacharyya	BYTE Mentee	Texas Instruments

Students' Activities & Achievements



Students' Activities & Achievements



Faculty Activities & Achievements

- Prof. Debabrata Roy is working as President of Institution's Innovation Council (IIC 7.0) from 21.11.2024
- Prof. Debabrata Roy is working as an expert member of School Research Committee (SRC) of Electrical Engineering of Maulana Abul Kalam Azad University of Technology (MAKAUT), West Bengal
- Prof. Abhinandan De delivered an invited talk on “Application of AI-ML in Power and Energy Sector” in the 4th Short Term Course on “Advances in Power Technologies (APT-2025) organized by the Department of Electrical Engineering, Motilal Nehru National Institute of Technology (MNNIT) Allahabad on 25th June, 2025.
- Prof. Abhinandan De was nominated as a Jury Member for the regional round of IET India Scholarship program 2025 held on 9 August 2025.
- Dr. Kaushik Mukherjee delivered an invited lecture titled, "Integrated Charging in Electric Vehicles" in the Faculty Development Programme named, "Analysis of Recent Trends in Electric Vehicles, Battery Technology and Integrated Control Systems", arranged by The Institute of Engineering & Management (IEM) Kolkata on 15.05.2025.
- Dr. Atanu Banerjee is serving as resource person during ATAL FDP at RVSCET Jamshedpur
- Dr Roshni Maiti was nominated by Capacity Building for Design and Entrepreneurship (CBDE) for Faculty Experience sharing session at IIIT, Una during 10 - 12 July 2025. (From 150 faculty members, 35 faculty members were selected to visit different institutions all across India.)
- Dr S A Qasim served as an External Examiner for the practical examination of Electrical Technology Lab – EEEA2972 (for 2nd Year BE Mechanical, AMU Aligarh) on 04th June, 2025.
- Dr S A Qasim served as an External Examiner for the practical examination of Power System & High Voltage Lab – EEEEC3920 (for 3rd Year BE Electrical, AMU Aligarh) on 18th June, 2025.
- Dr S A Qasim served as a Session Chair at the IEEE Sponsored 11th International Conference on Electrical Energy Systems (ICEES-2025) organized by Sri Sivasubramaniya Nadar College of Engineering, Chennai on 22nd Aug, 2025.

Faculty Activities & Achievements

DR. ROSHNI MAITI
OF ELECTRICAL ENGINEERING DEPT., IEST, SHIBPUR

WAS SELECTED BY CAPACITY BUILDING FOR DESIGN AND ENTREPRENEURSHIP (CBDE), LAUNCHED BY THE MINISTRY OF EDUCATION, GOVERNMENT OF INDIA, AND IMPLEMENTED THROUGH IIITDM, KANCHEEPURAM

AT **IIIT, UNA** ON **12.07.2025**

FOR FACULTY EXPERIENCE SHARING SESSION

HIGHLIGHTS

- INTRODUCED A MINI PROJECT BASED "INDUSTRIAL AUTOMATION LAB" TO PROMOTE HANDS-ON LEARNING.
- SHIFTED TO PROBLEM-BASED & APPLICATION-ORIENTED LEARNING.
- ALIGNED PEDAGOGY WITH NEP 2020 GOAL.

PROJECT-1: ROBOTIC MANIPULATOR

PROJECT-2: AUTONOMOUS VEHICLE

PRESENTATION AT IIIT, UNA

RECEIVED GUIDANCE FROM PROF. SUDHIR VARADARAJAN SIR, PROGRAM DIRECTOR OF CBDE

Visit to IIIT, Uni as Nominated Faculty by CBDE of Dr. Roshni Maiti



Visit to CESC by Faculty Members



With Prof. Parhi and Prof. Swain of IEC

Cleaning Drive by the Electrical Engineering (EE) Department for Clean & Green Campus



Editorial Team

Editor-in-Chief: Prof. Aparajita Sengupta

Professor and Head, Department of Electrical Engineering (EE), IEST, Shibpur, Howrah, WB.

Team Members::

Dr. Reetam Mondal

Dr. Roshni Maiti

Dr. S. A. Qasim

Dr. Mousumi Mukherjee

Dr. Pritam Paral

Dr. Sourav Dhara