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SANAKA EDUCATIONAL TRUST'S
GROUP OF INSTITUTIONS

(A UNIT OF SANAKA EDUCATIONAL TRUST)

Vill+P.O- Malandighi, P.S- Kanksa, Durgapur-713212

Approved By AICTE, Affiliated to MAKAUT, West Bengal





Dr Ranadip Roy

Associate Professor (HoD)

Electrical Engineering Department

Sanaka Educational Trust's Group of Institutions

Welcome to the Electrical Engineering Department

Our department is dedicated to nurturing talent and preparing students for real-world challenges through a blend of theoretical knowledge and practical applications. With experienced faculty committed to innovative teaching, we focus on developing professionals who can meet society's evolving needs. Team work is essential in our programs, where students collaborate in upgraded laboratories such as Electrical Machines, Power Systems, and Control Systems. These facilities enable exploration and innovation, enhancing technical expertise. We also engage students through our technical society, “TECHNO-SPARK” promoting extracurricular activities that build managerial and technical skills, while fostering confidence and leadership. To connect academia with industry, we organize expert lectures, workshops, and industrial visits that keep students updated on the latest trends. Our holistic approach has led to successful placements in organizations like PSPCL, Tata Consultancy Services, and the Indian Navy. In our department, students thrive in a supportive environment, guided by faculty expertise and peer collaboration, as we work together to shape the future of electrical engineering.

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Editor Board

1. Ajoy Ghosh (4th Year EE)
2. Arijit Dutta (4th Year EE)
3. Pratik Mondal (3rd Year EE)

Advisory Board

1. Mr. Pranendu Manna (Asst. Professor)
2. Dr. Nirmalya Mallick (Asst. Professor)

Vision-Mission Institutional



To emerge as a Centre of higher learning fostering a mutually beneficial relationship between professional competency and human values.



- ❖ To imbibe the outcome-based education system for continuous development of professional, social and ethical skills.
- ❖ To engage in research and innovation pertaining to the environmental concerns and societal needs.
- ❖ To forge collaborations with industries, academia of repute, research Centre's, and professional bodies to stay relevant and contemporary.



Vision
Mission

Vision-Mission Departmental

Vision



To envisage developing into and sustaining as a center of excellence by pioneering good quality education and research while producing competent and socially motivated Electrical Engineers. scientific and technological advancements and make them industry ready. To foster employability, entrepreneurship, leadership capabilities with ethics, and a research mindset.

PROGRAM EDUCATIONAL OBJECTIVES (PEOs):

- Contribute to the industry as a professional engineer providing solutions for practical problems and develop new techniques.
- Become entrepreneur and establish industry with leadership and professionalism involving team work and ethical practices.
- Pursue higher education and contribute in advanced research and development providing solutions to the emerging needs of the society.

PROGRAM SPECIFIC OUTCOMES (PSOs):

Students of Electrical Engineering will be able to –

- implement technical knowledge and skill to analyze electrical machines, power electronics components, and electrical system applications.
- explore the design of power system networks, the concept of renewable sources, and basics of automation.



PROGRAM OUTCOMES (POs):

PO 1: Engineering Knowledge	PO 7: Environment and Sustainability
PO 2: Problem Analysis	PO 8: Ethics
PO 3: Design / Development of Solutions	PO 9: Individual and Team Work
PO 4: Conduct investigations of Complex Problems	PO 10: Communication
PO 5: Modern Tool Usage	PO 11: Project Management and Finance
PO 6: The Engineer and Society	PO 12: Life-long Learning



"Innovative Minds"

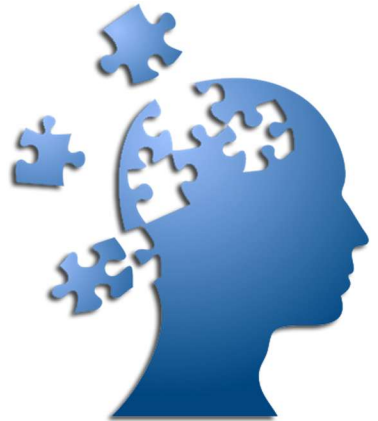
An Initiative to Promote Research Culture

Date: 09.08.2024

Workshop Outcome:

The session concluded with a vibrant discussion among the faculty members, who expressed their enthusiasm for the initiative and their willingness to contribute to the research culture within the department. The event was a significant step toward building a robust research environment, and it set the stage for future sessions in the "Innovative Minds" series.

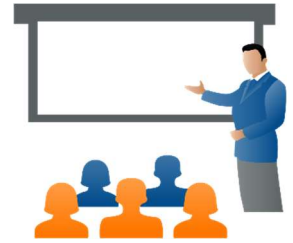
The Department has decided to meet again in the next session of this seminar on the third week of August, 2024 to address the Research Action Plan of the Department, in which all the faculties will contribute with their own views.



Departmental Activities

"Empowering Technical Excellence: 4 Days Technical Assistant Development Program"

Date: 12.08.2024 to 16.08.2024



Workshop Outcome:

Empowering Technical Excellence: 4-Day Technical Assistant Development Program

The **4-Day Technical Assistant Development Program** held from **12.08.2024 to 16.08.2024** at **Sanaka Education Trust's Group of Institutions, Electrical Engineering Department**, aimed to enhance the skills, knowledge, and professional development of technical assistants. Upon successful completion of this program, participants achieved the following outcomes:



1. **Enhanced Technical Proficiency:**

Participants gained in-depth knowledge of advanced tools, equipment, and technologies relevant to the electrical engineering domain.

2. **Improved Troubleshooting and Problem-Solving Skills:**

The program emphasized diagnostic methods, enabling technical assistants to address and resolve technical challenges efficiently.

3. **Knowledge of Safety and Standards:**

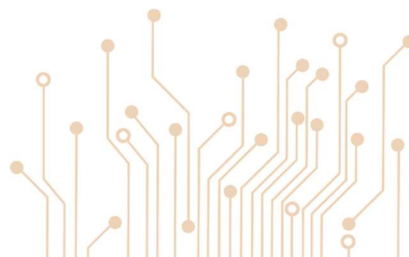
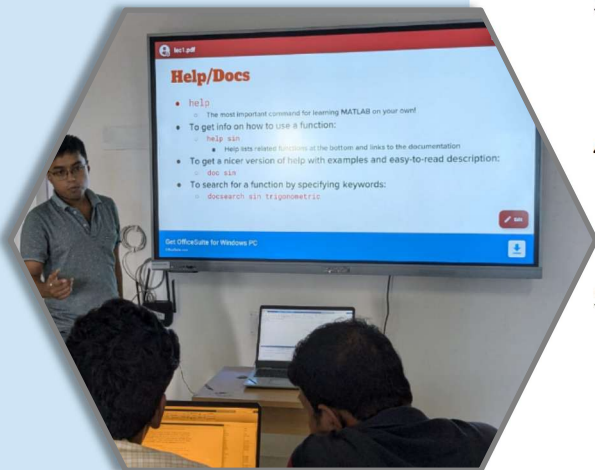
Training included guidelines on safety protocols and adherence to industrial standards, ensuring workplace safety and regulatory compliance.

4. **Skill Development in Laboratory Management:**

Participants learned effective methods for managing laboratory resources, maintaining equipment, and supporting faculty and students in academic and research projects.

5. **Hands-on Experience with Modern Equipment:**

Through practical sessions, attendees gained hands-on exposure to modern electrical engineering instruments, fostering confidence and operational expertise.



“INNOVATE & INTEGRATE: HANDS-ON IOT AND ROBOTICS-BASED PROJECT DEMO”

Date: 14.11.2024

Event Outcome:



The **INNOVATE & INTEGRATE: HANDS-ON IoT AND ROBOTICS-BASED PROJECT DEMO**, organized for fourth-year B.Tech students, successfully achieved its objective of providing practical insights into IoT and robotics project development. The following outcomes were realized from this event:

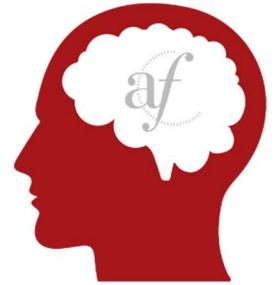
- Enhanced Practical Understanding:**
Students gained hands-on experience in integrating IoT and robotics concepts, translating theoretical knowledge into real-world applications.
- Project Development Skills:**
The event equipped participants with technical and problem-solving skills critical for executing their final-year projects with precision and innovation.
- Introduction to Cutting-Edge Technologies:**
Students were exposed to advanced tools, platforms, and methodologies in IoT and robotics, aligning with current industry trends and demands.
- Bridging the Knowledge-Application Gap:**
The demo provided a practical framework that bridged the gap between academic coursework and its practical implementation in project development.
- Improved Team Collaboration:**
Working in teams, participants honed their collaborative and interpersonal skills, essential for success in multidisciplinary engineering projects.
- Inspiration for Innovation:**
The event encouraged students to think creatively and adopt innovative approaches in designing IoT and robotics-based solutions for real-world problems.

The event's success was evident in the enthusiastic participation, quality of project ideas presented, and the students' improved understanding of IoT and robotics technologies, paving the way for academic and professional excellence.



"Innovative Minds"

The Department of Electrical Engineering has taken a significant initiative to promote a robust research culture within our department. As part of this initiative, we will be organizing faculty research presentations under the platform named "**Innovative Minds**", mentored by Dr. Nirmalya Mallick (Ex. Head of the Department).



Innovative Minds

An Initiative to Promote Research Culture

Semi-monthly research seminar organized by the Electrical Engineering Department

Department of Electrical Engineering
Sanaka Educational Trust's Group of Institutions,
Malandighi, Durgapur



"Short Time Certificate Courses"



MATLAB Odyssey Overview

The Electrical Engineering Department is throwing a party and you're invited! Get ready for a five-day MATLAB extravaganza where you'll level up your skills with hands-on fun and a fancy certificate to show off!

Masters of the Mystical Arts.

Dr. Nirmalya Mallick
(8 years experience in MATLAB)

Mr. Chinmoy Chakraborty
(10 years Industrial and Academic expertise)

Mr. Siddhartha Chakraborty
(5 years experience in Academic Projects)

Course Highlights

- Dive deep into the mystical world of MATLAB Magic
- Set sail on a speedy journey through the land of coding
- Join captivating live sessions led by Experts
- Shed light on your academic projects
- Lay the foundation for your future research adventures
- Earn the crown of certification upon conquering these challenges



Be confident in your abilities!

For more information or inquiries, don't hesitate to get in touch with us at 8348318604 or ee.setgoi@gmail.com



<https://icampus.setgoi.ac.in>



MATLAB Odyssey
From Foundations to Frontiers

Short Term Certificate Course

Department of Electrical Engineering
Sanaka Educational Trust's Group of Institutions,
Malandighi, Durgapur: 713212



Who Should Attend

Diploma & B.Tech. Students

Registration

To register for the program, please scan the QR Code and fill in your details.



Registration Fee
INR 200

Program Details

Day 1

"MATLAB Mania: Your First Code Quest!"

Kick off the adventure with MATLAB Mania! Embark on your first coding quest as you explore MATLAB's interface and master the basics of programming. It's all about building the foundation while having fun with your first coding creations!

Day 2

"Data Dive: Ride the Visualization Wave!"

Ride the wave of data excitement on Day 2! Dive into the ocean of data handling and learn how to make your findings pop with eye-catching visualizations. Transform raw numbers into stunning plots and graphs that tell compelling stories.

Day 3

"Code Ninja: Master the Art of Control!"

Step into the dojo and become a Code Ninja! Day 3 is all about mastering control structures—loops, conditionals, and functions.

Day 4

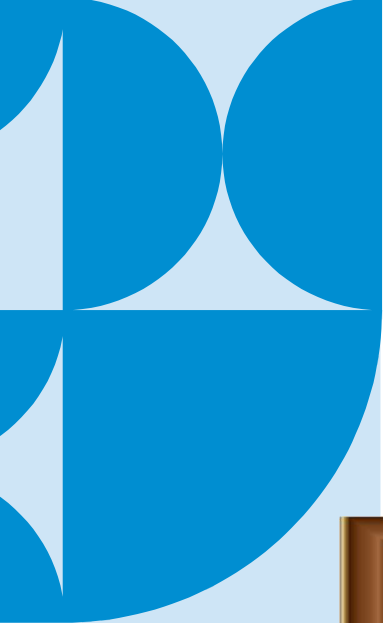
"Toolbox Treasure Hunt: Discover Hidden Gems!"

Join the Toolbox Treasure Hunt and uncover hidden gems within MATLAB Simulink to turn complex problems into simple, visual solutions.

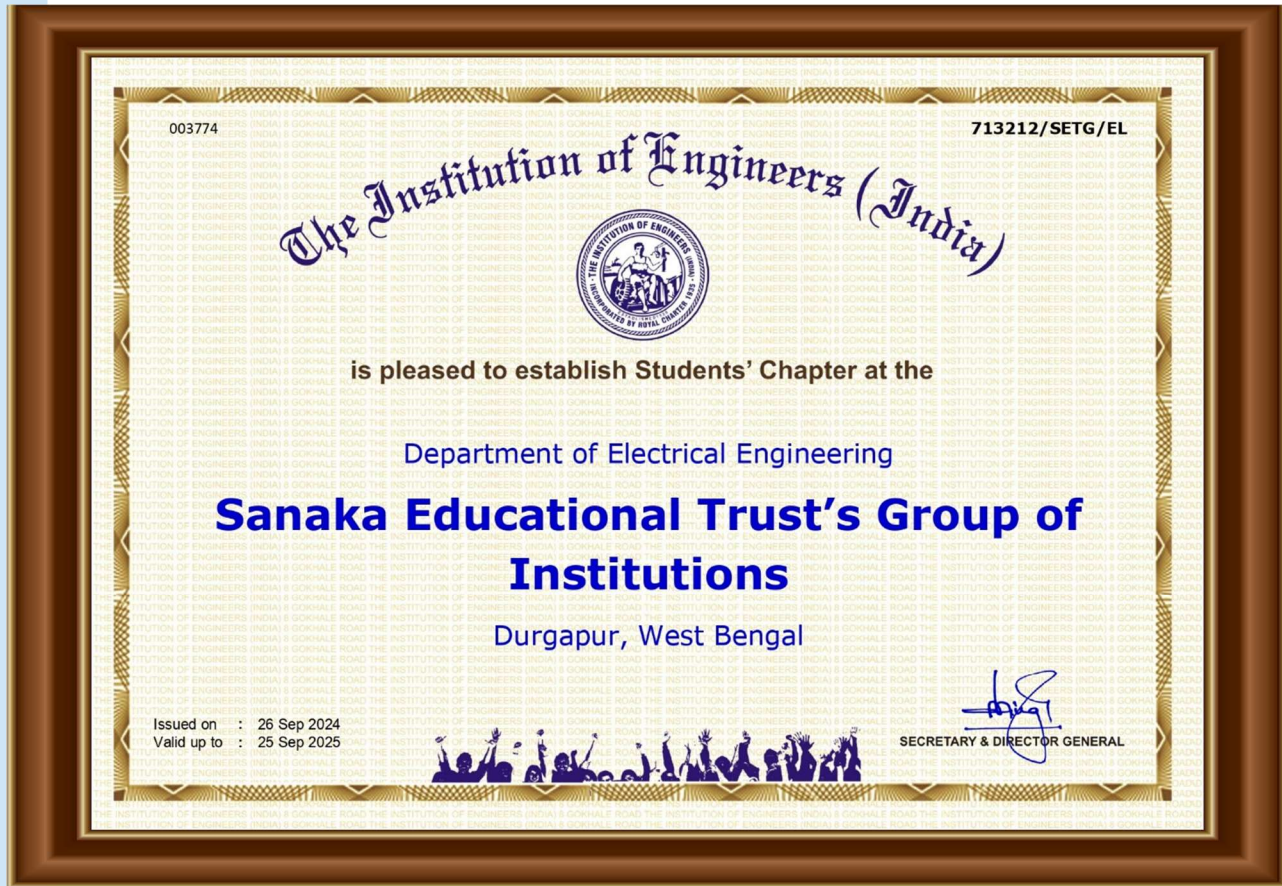
Day 5

"Code Masters: The Ultimate Challenge!"

Are you ready to become a Code Master? On the final day, gear up for the ultimate challenge! Delve into advanced coding techniques and showcase your skills in an epic coding showdown.

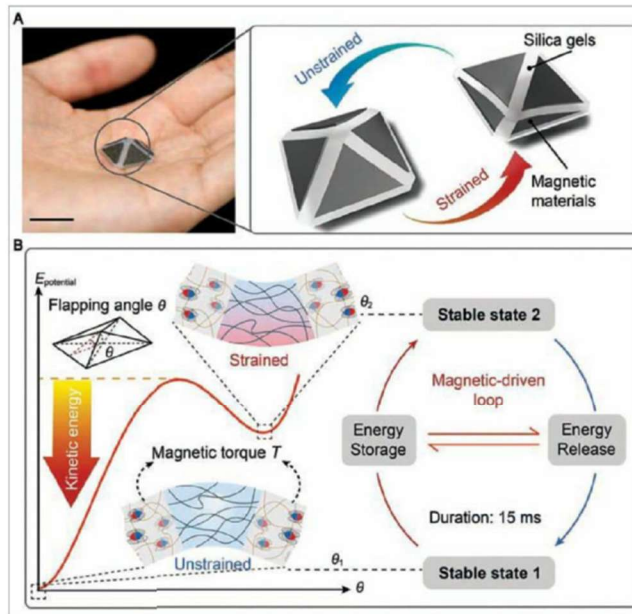


Achievements



Electrical Facts

Magnetically driven soft jumping robot



Researchers from Zhejiang University in China have developed a magnetically driven, bistable soft jumper with superior jumping capabilities. This robot jumps higher and faster than previous models, offering potential applications in navigating complex terrains and confined environments. Using elastic, deformable materials, it resists impact damage while achieving take-off speeds over two metres per second and response times under 15 milliseconds. The bistable mechanism releases stored energy, enabling jumps more than 108 times its body height. Tests showed it can navigate amphibious terrain, U-shaped structures, and jump from underwater. Adjustable magnetic fields control jump height and distance, making it versatile for future robotic systems.

Schematic illustration of bistable soft jumper (Credit: Daofan Tang)

Highest-powered Wi-Fi HaLow module

Teledatics has introduced and certified its TD-HALOM Wi-Fi HaLow module, known for its low power consumption and long-range capabilities. Powered by Newracom's NRC7394 system-on-a-chip (SoC), this module operates at



1W or 30dBm output power, maximising the range and signal penetration within the limits set by the FCC. The module is designed for applications that require long-range connectivity, such as drone operations, industrial settings, and outdoor environments, where throughput and reliable communication over long distances are essential. Its power output ensures extended connectivity and improved data transfer rates. It is compact, measuring 13.5mm x 18mm and 2.4mm in height, enabling integration into small-scale designs.

Teledatics & Newracom
<https://newracom.com>
<https://www.teledatics.io>

The world's smallest addressable LED

The SMD LED - Addressable RGB APA-104-1010 measuring 1.0mm x 1.0mm is a development in the trend of miniaturisation.



Despite its size, it maintains the same functionality as its larger counterparts, making it an option for applications where space is critical. These LEDs are suitable for projects involving wearable technology, drones, or any device where space and weight are limited. Designers can now incorporate RGB lighting without compromising the size or weight of their creations. The size allows for versatile PCB layouts, enabling new designs, especially in devices like drones and wearables. Additionally, the energy efficiency of these LEDs, with a maximum current draw of 15mA per LED, makes them suitable for battery-powered applications where conserving power is important.

Sparkfun
<https://www.sparkfun.com>

Play putty for flexible biometric sensors

Researchers at the University of Massachusetts Amherst have developed a low-cost alternative for monitoring brain, heart, muscle, and eye activity using homemade play putty called 'squishy circuits.' Made from common ingredients



Play putty for flexible biometric sensors (Credit: <https://www.umass.edu>)

like flour, water, salt, cream of tartar, and vegetable oil, the salt provides conductivity. Typically used as an educational tool, these circuits can now measure bioelectrical signals such as EEG, ECG, EOG, and EMG. They perform as well as commercial electrodes but cost just one cent per electrode. The putty is reusable, adaptable to skin contours, and offers an affordable, accessible option for bioelectrical measurements.

AC/DC power supplies

Traco Power's TXN series offers 50, 75, and 100-watt models, replacing the older TXL, TXM, and TXH lines while maintaining familiar design principles for a seamless transition. These compact power supplies feature a low-profile metal enclosure and screw terminal block for easy installation, catering to industrial setups. With an operating range from -40°C to $+70^{\circ}\text{C}$, 3000V AC reinforced isolation, and built-in protection against short circuits, overvoltage, and overload, the series ensures safety and durability. Compliance with the industrial standards, combined with fanless convection cooling, makes it reliable, and cost-efficient for industrial use.

Traco Power
<https://www.tracopower.com/int>

" Research Publication"



1. **Roy, R.**, Mukherjee, V., Singh, R. P., & Prasad, D. (2024). Modified student psychology-based optimization based model order reduction of power system. *e-Prime-Advances in Electrical Engineering, Electronics and Energy*, 7, 100497.
2. Prasad, D., Singh, R. P., Gupta, G., Kumar, M., Anand, J., & **Roy, R.** (2024). Energy-Efficient Grid Interactive Building Optimization With Green Energy for Net-Zero Emission. In *Advancements in Renewable Energy and Green Hydrogen* (pp. 106-129). IGI Global.
3. Prasad, D., Singh, R. P., Mahata, S., & **Roy, R.** (2024). Green Energy Supply Analysis to Sustainable Inland Water Tourism Regions in Eco-Friendly Cities. In *Achieving Sustainable Transformation in Tourism and Hospitality Sectors* (pp. 90-113). IGI Global.
4. Prasad, D., Singh, R. P., Anand, J., **Roy, R.**, & Chakraborty, S. (2024). Integrated Approach for Green Hydrogen Production and Sustainable Electrification of Railway Platform With Solar Energy Sources. In *Advancements in Renewable Energy and Green Hydrogen* (pp. 154-182). IGI Global.
5. Prasad, D., Singh, R. P., Kumar, R., **Roy, R.**, Islam, A., & Khan, M. I. (2024). Modeling of Green Hydrogen and Electricity Coproduction System for Techno-Eco-Environmental Analysis of Sustainable Microgrid. In *Intelligent Methods and Alternative Economic Models for Sustainability* (pp. 21-43). IGI Global.
6. Prasad, D., Singh, R. P., **Roy, R.**, & Khan, M. I. (2024). Green Energy Harvesting for Supply Autonomy of a Tourist Town With Solar and Wind Energy Resources. In *Emerging Materials, Technologies, and Solutions for Energy Harvesting* (pp. 286-315). IGI Global.
7. Singh, J., Prasad, D., Singh, R. P., Mondal, S. S., Banerjee, A., & **Roy, R.** (2024). Integrated modeling of standalone electric vehicle fast charging system with invoicing solution
8. **Mallick, N.**, Nandi, A., **Roy, R.** (2024). Profit-based unit commitment using local and global search methods. In *Robotics and Automation in Industry 4.0*. Bentham Books.
9. **S. K. Das** and S. Sarkar, "Impact of Distributed Generations on Loss Allocation in Grid-connected and Grid-isolated Distribution Systems," 2024 IEEE 4th International Conference on Sustainable Energy and Future Electric Transportation (SEFET), Hyderabad, India, 2024, pp. 01-06
10. Pal, K., Goswami, S., Benia, T. K., Bhuyan, A., **Manna, P.**, & Kumbhakar, S. (2024, May). Machine Learning Based Approach by Image Recognition for Detection of Islanding. In *2024 International Conference on Smart Systems for applications in Electrical Sciences (ICSSES)* (pp. 1-6). IEEE.
11. Pal, K., Goswami, S., **Manna, P.**, Kumbhakar, S., Benia, T. K., & Yadav, P. K. (2024, April). Islanding Detection Using Pattern Recognition with HOG Features by Random Forest. In *2024 IEEE Third International Conference on Power Electronics, Intelligent Control and Energy Systems (ICPEICES)* (pp. 802-807). IEEE.
12. Pal, K., Goswami, S., Debbarman, S., **Manna, P.**, Kumbhakar, S., & Bhuyan, A. (2024, April). Detecting Islanding by Ensemble Classifier for Pattern Recognition Using HOG Features. In *2024 IEEE Third International Conference on Power Electronics, Intelligent Control and Energy Systems (ICPEICES)* (pp. 514-519). IEEE.