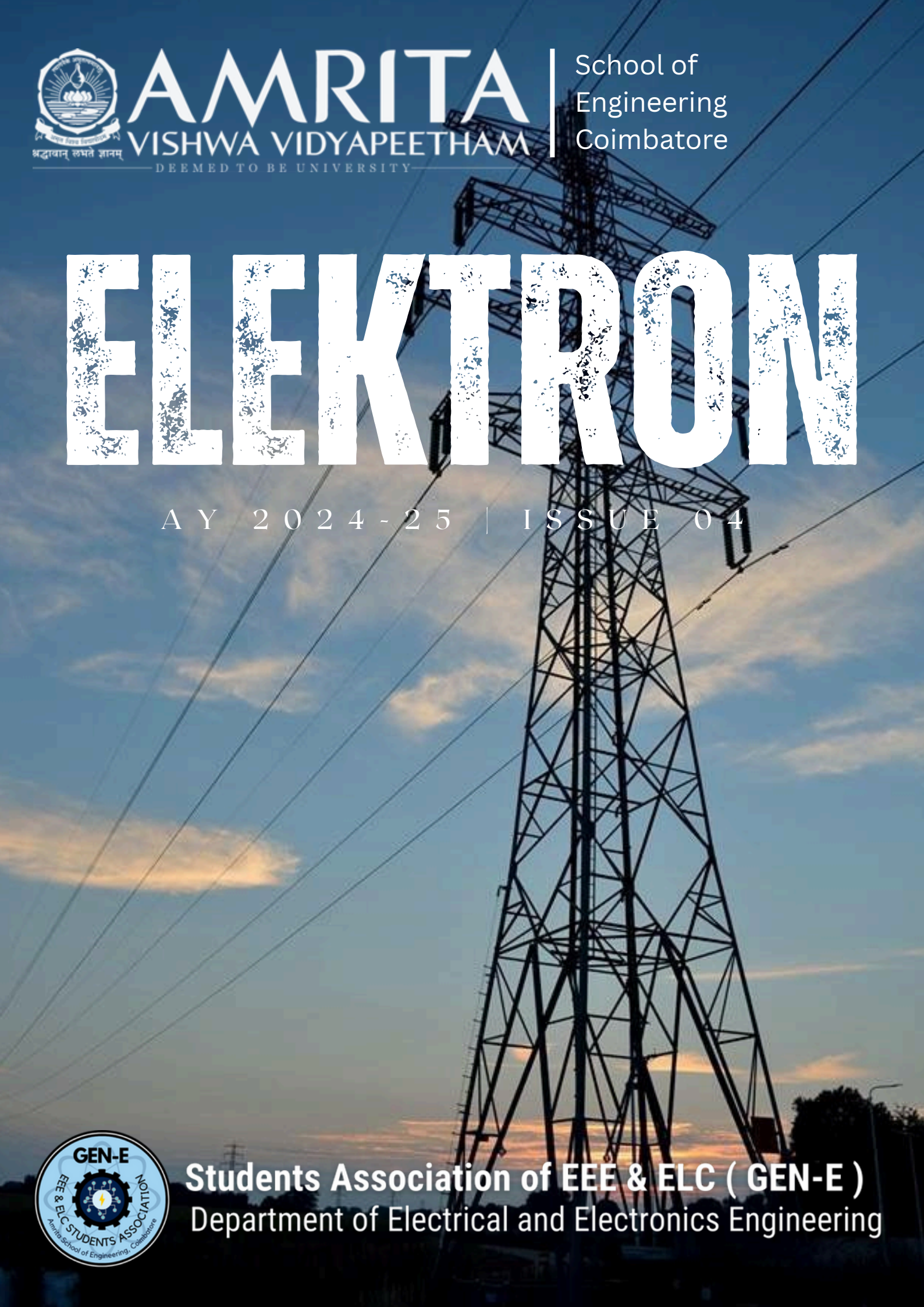
AMRITA VISHWA VIDYAPEETHAM
DEEMED TO BE UNIVERSITY

School of Engineering Coimbatore

ELEKTRON

AY 2024-25 | ISSUE 04



Students Association of EEE & ELC (GEN-E)

Department of Electrical and Electronics Engineering

About Us

The Department, established in 1994, is supported by a dedicated team of academic and technical staff committed to excellence in teaching and research. It is equipped with well-developed laboratories and a comprehensive library that cater to the needs of undergraduate, postgraduate, and research scholars. Graduates and postgraduates of Electrical and Electronics Engineering are well-prepared to pursue diverse and challenging career opportunities across industries and to actively contribute to research and development.

The Department houses specialized laboratories in Power Electronics, Electrical Machines and Control Systems, Electrical Measurements, Embedded Systems, and an Electrical Workshop. Each laboratory is furnished with advanced instruments and equipment to support effective teaching, hands-on learning, and research activities.

Through a Memorandum of Understanding (MoU) with Uppsala University, Sweden, a faculty member is currently pursuing doctoral research under a twinning programme. Furthermore, both faculty members and students are actively engaged in research collaborations with various European universities under the EURECA Programme.

Mission

- Empower students with knowledge in Electrical, Electronics, and allied engineering through innovative classrooms and state-of-the-art laboratories.
- Foster technical competence and promote research through industry collaborations, field exposure, and global partnerships.
- Uphold professional ethics and nurture a spirit of selfless service.

Vision

To mold generations of Electrical and Electronics Engineers with a multidisciplinary outlook, aligned to global standards, and equipped to address the evolving needs of society.

Who are we?

Gen-Electric (Gen-E) is the student association representing the streams of Electrical and Electronics Engineering (EEE) and Electrical and Computer Engineering (ELC). Formerly known as the Association of Electrical and Electronics Engineering (AEEE), it functions under the Department of Electrical and Electronics Engineering with the goal of strengthening student connections within the department. Beyond academics, Gen-E also strives to create a space where students can nurture their technical interests and broaden their horizons.

One of its key initiatives is Elektron, the department's official e-magazine, revived in 2022. Elektron serves as a creative and intellectual platform featuring contributions from both students and faculty members. With technology in the fields of electrical, electronics, and computers advancing rapidly, the magazine plays an important role in keeping pace with emerging innovations. It is designed to encourage students to delve into diverse areas of interest whether technical or non-technical and to provide a platform for sharing knowledge, perspectives, and creativity beyond the boundaries of textbooks.

CONTENTS

AI-Based Predictive Maintenance in Industrial System

Imagine a large manufacturing plant running smoothly until suddenly, a machine breaks down and causing big losses. But what if there was way to see these failures coming and stop them before they happen? That's where AI-based predictive maintenance comes in."

Predictive Maintenance (PdM) is changing the way industries take care of their machines. Instead of waiting for equipment to breakdown, AI helps predict problems before they happen. This means businesses can keep things running smoothly, reduce downtime, and save money while making maintenance smarter and more efficient.

In the EEE field, predictive maintenance plays a vital role in keeping electrical systems, industrial equipment, and automation processes running smoothly. With the help of AI, it can detect potential issues early, prevent unexpected breakdowns, and extend the life of machines. This not only save time and costs but also ensures reliable performance across industries like manufacturing and energy.

BACKGROUND:

Industrial maintenance has evolved from basic repairs to sophisticated predictive techniques. Early methods included:

- *Reactive Maintenance* - Waiting for equipment to break down before fixing it.
- *Preventive Maintenance* - Performing routine maintenance on a set schedule, even if it's not needed.
- *Predictive Maintenance (PdM)* - Using AI and sensor data to predict issues before they happen. The shift to PdM was driven by advancements in AI, the Internet of Things (IoT), and big data analytics.

TECHNOLOGIES AND TOOLS IN PREDICTIVE MAINTENACE:

Today's industrial machines come with smart sensors that track important factors like:

- Temperature - Detecting overheating or unusual temperature changes.
- Vibration - Identifying early signs of mechanical wear or misalignment.
- Pressure - Monitoring fluid or gas pressure to prevent system failures.
- Current and Voltage - Ensuring electrical systems run safely and efficiently.

DATA PREPROCESSING AND CLEANING:

Before AI can make sense of sensor data, it needs to be cleaned and organized. Common techniques include: Noise Reduction, Outlier Detection, Normalization

By refining raw sensor data, these techniques help AI detect real issues, leading to smarter and more precise predictive maintenance.

DATA COLLECTION AND PREPROCESSING:

Types of Data Collected:

- Sensor Data - Real-time readings from machine, tracking temperature, vibration, pressure, and more.
- Historical Maintenance Records - Past breakdowns, repairs, and service logs that help AI identify recurring patterns.
- Environmental Data - Factors like humidity, temperature, and air quality that can affect machine performance.

By gathering and analyzing this data, AI can detect early warning signs of equipment failure, helping industries stay ahead of costly breakdowns.

PREPROCESSING TECHNIQUES:

AI models require clean and well-structured data. Techniques include:

- Imputation - Filling in missing values to ensure complete and reliable data.
- Feature Engineering - Identifying and extracting the most important data points for better AI analysis.
- Dimensionality Reduction - Removing irrelevant or reductant data to speed up processing and improve efficiency.

.contd

AI-Based Predictive Maintenance in Industrial System

Predictive maintenance powered by artificial intelligence applies machine learning techniques to anticipate equipment failures and schedule maintenance proactively. By analyzing patterns in sensor data, these models help industries reduce downtime, cut costs, and enhance safety.

Machine Learning Models:

- Decision Trees and Random Forests – Widely used for classifying equipment conditions and detecting failures.
- Support Vector Machines (SVMs) – Effective in identifying anomalies and subtle changes in machine behavior.
- Neural Networks – Capture complex non-linear relationships between operational data and equipment health.
- Deep Learning Approaches:
  - Recurrent Neural Networks (RNNs) and Long Short-Term Memory (LSTM) are ideal for time-series data, enabling accurate forecasting of machine degradation trends.
  - Convolutional Neural Networks (CNNs) are used in image-based applications, such as detecting cracks, corrosion, or surface wear.

REAL-WORLD APPLICATIONS:

- Automotive Industry – Used to predict component failures, monitor vehicle performance, and enhance reliability.
- Oil and Gas Industry – Helps in monitoring pipelines, detecting leaks, and predicting faults in drilling equipment.
- Aerospace Industry – Assists in aircraft engine health monitoring, reducing unexpected breakdowns, and improving safety.
- Energy Sector – Enables real-time monitoring of turbines, transformers, and grid systems to prevent power outages.

Benefits:

- Reduced downtime through early fault detection.
- Cost savings by optimizing maintenance schedules.
- Enhanced safety by preventing critical failures.

Challenges:

- High initial investment in infrastructure and AI deployment.
- Data privacy and security concerns.
- Risk of false alarms or inaccurate predictions, which can affect trust in the system.

FUTURE DIRECTIONS:

Emerging Trends

- Edge Computing will minimize data transmission delays, enabling faster AI-based predictions.
- Explainable AI (XAI) will make machine learning models more transparent and easier to interpret.
- AI-Driven Robotics will enable autonomous maintenance, where intelligent robots carry out inspections and repairs.

Big Data and Predictive Analytics

The fusion of big data and AI is transforming predictive maintenance. By processing millions of sensor readings in real time, industries can achieve higher predictive accuracy and make more informed maintenance decisions.

CONCLUSION:

AI-powered predictive maintenance is reshaping the future of industrial operations by improving efficiency, reducing costs, and ensuring safety. With continuous advancements in machine learning, IoT, and big data analytics, maintenance strategies are becoming more proactive and intelligent. Industries that embrace AI-driven predictive maintenance gain a competitive edge in reliability, performance, and sustainability.

LATHIKA JENIFER

The Making of KATRINA MARK -II

At MotoAmrita, a culture of engineering excellence and relentless innovation culminated in the creation of KATRINA MARK-II — a high-performance electric superbike engineered specifically for competitive racing. Designed by the students of Amrita Vishwa Vidyapeetham, the machine is a blend of cutting-edge design, precision mechanics, and future-focused electric mobility.

The team's efforts were recognized at the prestigious FMAE MotoStudent India Competition, where Katrina Mark-II earned:
AIR 1 – Overall Category Championship
AIR 1 – Design Evaluation
AIR 1 – Cost Evaluation
These accolades stand as a testament to the rigorous research, detailed engineering, and seamless collaboration that defined the project from concept to track.
KATRINA MARK-II was engineered for high efficiency and performance, integrating advanced power-train and control technologies:

- Motor: Permanent Magnet DC (PMDC) motor, delivering 10kW peak power and 7.65kW nominal power, ensuring high torque and acceleration.
- Controller: Kelly KPM motor controller, offering precise power delivery and seamless integration with the battery.
- Battery Management System (BMS): DALY Smart BMS (200A rating), providing cell balancing, thermal regulation, and over current protection for optimal safety and efficiency.

In-House Designed Battery System

A key aspect of our success was the design and assembly of the battery pack, developed entirely in-house to optimize power delivery and endurance.

- Cell Chemistry: Lithium-ion NMC (Molicel P42A) – 4.2V / 4.2Ah
- Configuration: 13S8P, achieving the ideal balance between energy density and power output.
- Assembly Method: Spot welding, ensuring low resistance connections and high structural integrity.
- Simulation-Driven Optimization:
  - The battery design was finalized after conducting extensive drive cycle simulations using OPTIMUM LAP software.
  - By incorporating track-specific mechanical parameters, we developed an accurate energy consumption model, guiding the optimization of battery capacity and discharge characteristics.
  - The final battery system achieved a maximum range of 30 km, striking a balance between performance and efficiency.

Thermal Management for Battery

Effective thermal management was essential to maintain the battery's performance and longevity. Our approach included:

- Active Cooling System: Two 50 CFM cooling fans (total 100 CFM airflow) to regulate battery temperature and prevent overheating.
- Computational Fluid Dynamics (CFD) Analysis: Conducted in ANSYS, ensuring optimal heat dissipation and airflow distribution.
- This system effectively managed battery temperatures during high-load conditions, enhancing efficiency, safety, and lifespan.

.CONTd

The Making of KATRINA MARK -II

Custom Electronics and Instrumentation

To ensure seamless integration and real-time monitoring, we developed a custom PCB, specifically designed for:

- Low-voltage power distribution, ensuring stable operation of auxiliary systems.
- Precharge and discharge circuits, preventing voltage surges and ensuring controlled power flow.

For advanced rider feedback and data analysis, KATRINA MARK-II featured:

- Custom Instrument Cluster: A Crystalfontz TFT touch display, providing an interactive interface.
- Data Logging System: A Raspberry Pi-based system, capturing real-time data from the BMS for performance analysis.
- Speed Measurement: A proximity sensor, ensuring precise velocity tracking.

Safety and Power Management

With safety at the forefront, our design incorporated:

- Precharge Circuit: Protecting electrical components by eliminating inrush currents.
- Advanced Insulation Monitoring Device: Ensuring continuous fault detection and insulation integrity.

Challenges and Achievements

Developing a race-ready electric superbike from scratch posed significant engineering challenges. From powertrain optimization and thermal management to battery design and real-time monitoring, every element required extensive research, validation, and iterative improvements.

Our first-place victories in all three major competition categories validated our innovative approach, cost-effectiveness, and superior design strategy. KATRINA MARK-II is a true representation of our relentless pursuit of engineering perfection.

Conclusion

The success of KATRINA MARK-II at FMAE MotoStudent India highlights MotoAmrita's expertise in electric vehicle development. This project serves as a stepping stone for future advancements in high-performance EV technology, reinforcing our commitment to pushing the boundaries of innovation and sustainable mobility.

Behind the Chalkboard

ft. Dr. Sindhu Thampatty K. C

About

Dr. Sindhu Thampatty has been with Amrita's Department of Electrical and Electronics Engineering since 1996, contributing extensively to teaching and research. She earned her B.Tech. in Electrical and Electronics Engineering and M.Tech. in Energetics from NIT Calicut, with her thesis focusing on Environmentally Constrained Optimum Economic Dispatch. In 2011, she completed her Ph.D. in Power Systems from NIT Calicut, working on A TCSC Based Adaptive SSR Damping Controller Using Real Time Recurrent Learning Algorithm. Over her career, she has guided numerous B.Tech. and M.Tech. projects and has actively served as a reviewer for reputed journals and conferences.

The Early Spark

Prof. Sindhu's path into teaching was lit early. "From childhood, I was always drawn to teaching. I used to dream of being an LKG or UKG teacher," she smiles. But destiny had grander plans. After completing her M.Tech, she immediately joined the college as a faculty member, setting in motion what would become a lifelong bond with the institution. Her entry into electrical engineering wasn't a calculated move — it was a decision shaped by academic rankings and the wisdom of her father, who worked at NIT Calicut. "At that time, we didn't know much about the branches. My father said electrical was the best — and I trusted him," she reflects. That trust turned into love, a deep-seated affection for the discipline that continues to this day.

On Teaching and Gender Dynamics

Asked about her experience as a woman in a traditionally male-dominated field, Prof. Sindhu points out the shifts over the years. "When I studied B.Tech, we had only 12 girls out of 90 in electrical. Girls in mechanical were unthinkable. But today, women are everywhere — and that's encouraging." While she acknowledges occasional challenges, she believes that the gender gap in engineering is narrowing and evolving positively. More pressing, however, are the challenges of modern academia itself. "These days, everything feels like a number game — CGPAs, placements, filters. We're losing the sincerity that used to define teaching. Earlier, we'd get letters from parents appreciating our teaching. Now, the focus has shifted."

A Home Called Amrita

Prof. Sindhu's connection with Amrita goes beyond her job. "I joined here in 1995. Back then, we were just 25 staff members — like a family," she recalls. Her children were born and raised on campus, and her parents too lived within the university quarters. "It's not just professional — this campus has been my life." The emotional and spiritual ecosystem of Amrita is something she treasures deeply. "The care, the respect, the spiritual activities — all of it makes life here peaceful and fulfilling."

The Power of Role Models

Much of Prof. Sindhu's inspiration comes from her teachers, especially Dr. Sriram Kumar, her guide during B.Tech and M.Tech at NIT. "He explained everything with real-world examples. That kind of teaching sticks with you. Even now, when I teach, I recall how he did it." She believes that good teachers are not just conveyors of content — they are role models, torchbearers. "Even how he cleaned the board after class — that discipline left an impression," she adds. But above all, her greatest role model was her father. "He was systematic, deeply understanding, and always there to support me — especially when I was doing my PhD with small children at home. When I wanted to quit, he simply said, 'You can do it.' That belief carried me through."

.ContD

Behind the Chalkboard

ft. Dr. Sindhu Thampatty K. C

Stories That Stay

Among the hundreds of students she's mentored, some stories remain etched in her memory. One such story is of a student from the 2015 batch. "He was slow-paced, had a CGPA around 6.5, but he was dedicated. He'd visit us every day to clear doubts." With perseverance and mentorship, he went on to work at ABB Netherlands, involved in developing universal EV charging solutions and even visited campus on a chartered flight as a representative. Another touching story involves a student who was on the verge of dropping out due to financial difficulties. "We reached out to our alumni. They pooled in funds and supported his fees, asking only that he pay it forward. He got placed soon after — and it changed his life."

The Evolving Landscape

Prof. Sindhu is hopeful about the future, especially with the rise of renewable energy. "By 2030, 60% of our energy is expected to come from renewables. Even companies now require energy engineers for carbon certification. This is the me for students to explore this sector." She also highlighted the growing potential of hydrogen vehicles, citing her students' work in Tata Elxsi and how EVs are slowly shitiing toward hydrogen-based alternatives.

Final Words to Students

"To every student," she says gently, "have a spark. Learn something new every day. Don't just follow the crowd — try to make a 1% change in the path you take. Be open. Be curious." In a world rushing toward AI, automation, and analytics, Prof. Sindhu stands as a beacon of what it truly means to be an educator — to guide, to inspire, and to believe. Her journey reminds us that at the heart of every great institution are teachers who carry both chalk and compassion.

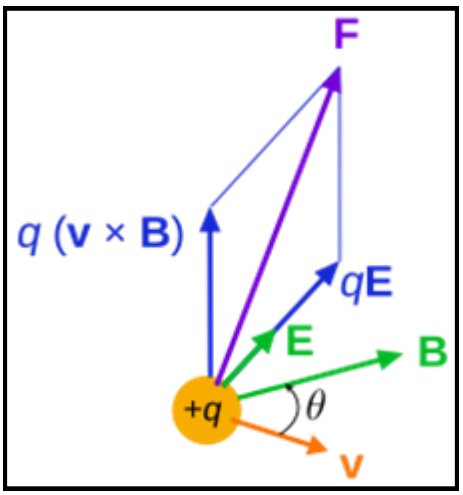
LORENTZ FORCE UNLEASHED: COOL FLUIDS, HOT TECH

The electromagnetic force F on a test charge at a given point and time is a certain function of its charge q and velocity v, which can be parameterized by exactly two vectors E and B, in the functional form.

$$F = q\,(E + v \times B)$$

In layman's language, a charge experiences a force due to its velocity and its own inherent property. A charge moving with velocity gives rise to a magnetic field, and the property gives rise to an electric field. Skipping the theory behind, we move to the fun part: the potential applications of it in the field of maintenance.

We all have handheld electronic devices like smartphones and laptops. All of these devices have a microprocessor, battery, storage, etc. The harder we push the device, the more computational power it requires, and the hotter it becomes. Let's face it, we don't like losing a clutch moment in a FIFA match or getting humiliated after being shot dead in Fortnite. Now, if you mix this with a hot mobile or a laptop, this is the perfect recipe for disaster. No one likes a hot device, gushing out hot air, with the annoying fan noise. This is the reason why some gaming freaks have resorted to another mode of cooling called liquid cooling. But most of us have seen it fail miserably. What else can be done? Well, here is a replacement for the conventional cooling system.



Magnetohydrodynamic pumps (MHD), even though it sounds like something out of a sci-fi movie, are a simple concept that uses the Lorentz force generated by the interaction between electric and magnetic fields to propel conductive fluids.
MHD-driven flow has gained attention for its potential to improve fluid motion, enhance heat transfer, and create tuneable flow profiles without the need for mechanical pumps. The integration of MHD with electro-osmosis mentioned above introduces the possibility of optimizing cooling performance, controlling ion accumulation, and reducing flow dispersion.

This process is proven suitable for high-temperature industrial processes and could replace even conventional fans or water-based coolants if they fail. Given that this is useful in large-scale usage, implementing this in smaller systems like microcontrollers is a bit tricky. Let's be optimistic and look at the bright side of this method.

Convection is observed to be more efficient when compared with radiation or simple fans used to remove the heat out of the system. This is achieved using water cooling. But to achieve forced convection, the liquid has to travel through micro-channels that have to come in close contact with the heated area so that heat is transferred from the hotter body (the system) to the cooler body (the liquid), and this heat is removed from the liquid through a heat sink and is supplied back into the system. As this requires a pump that consumes a lot of power, adds to the overall cost of the system, and also has the risk of failures, this doesn't sound like a reliable and wise solution to the stated problem.

Here is where magnetohydrodynamic pumps come into the picture. The pump works on the interaction between the magnetic field, electric current, and a conductive fluid. When all parameters are aligned correctly, this will result in the movement of the conductive fluid.

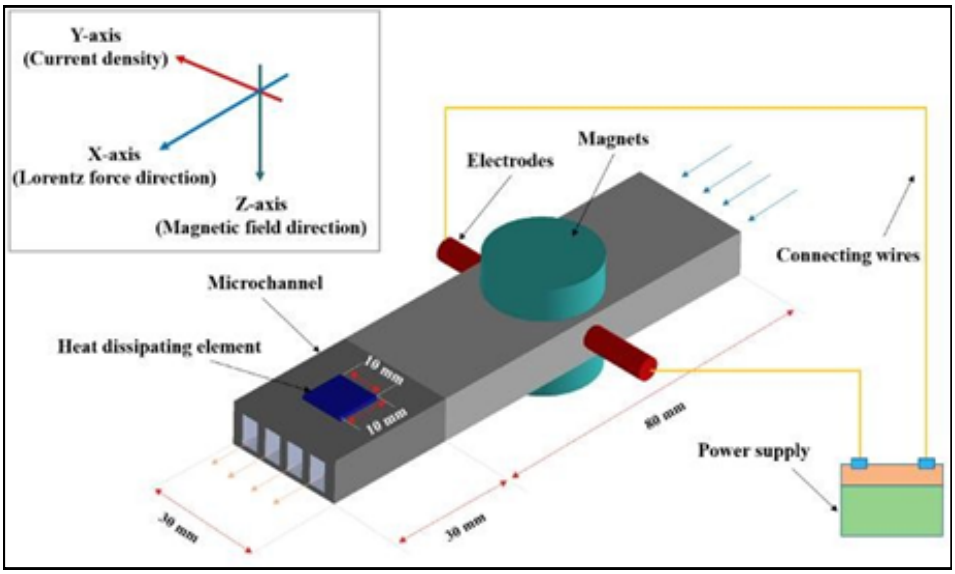
.Contd

LORENTZ FORCE UNLEASHED: COOL FLUIDS, HOT TECH

The conductive fluid in MHD pumps should not only have the ability to interact with the electric and magnetic field; it should also have the capability to store heat and disperse it in a small duration. Some common choices include liquid metals like sodium, potassium, and NaK alloys due to their high conductivity and thermal efficiency, but they are highly reactive and need an inert environment. Saline solutions and ionized plasma are also used but have lower conductivity and may deposit salts in the tubs, creating clogs. Alternatives like gallium alloys, ionic liquids, and nanofluids offer potential improvements.

A strong external magnetic field is applied across the fluid. Two electrodes are placed in contact with the fluid to provide an electric current through it.

When you have a liquid that conducts electricity— like saltwater or plasma—passing an electric current through it creates a flow of charged particles between two electrodes. When you add a magnetic field that runs perpendicular to this current flow, something fascinating happens: the charged particles feel a force pushing them sideways, perpendicular to both the current and magnetic field.



This causes a movement in the liquid. This motion can be utilized to remove heat out of the system without the need for mechanical parts or propellers. This makes MHD pumps highly reliable and suitable for extreme environments. And the biggest advantage is the electric current used to power the system could be used to move the liquid; isn't this amazing? Two birds, one stone it is.

Even though this sounds like a miracle solution to the heating issues, it isn't all blessed. The high cost of the superconducting magnets and finding the perfect conducting fluid for this task remain a task for the future. Flow instability and reverse flow issues can lead to reduced cooling efficiency.

-Adhvaith H
[CB.EN.U4EEE23001]

ELECTRO OSMOSIS: A MEDICAL BREAKTHROUGH

HOW DOES ELECTRO-OSMOSIS WORK

Many drugs face challenges in penetrating the body's natural barriers, limiting their effectiveness. What if an electric field could facilitate their movement, ensuring faster absorption for better results? The answer lies in electroosmosis—a phenomenon that enables fluid movement under the influence of an electric field. This effect has applications in drug delivery, engineering, and microfluidics

WHAT IS ELECTROOSMOSIS?

Electroosmosis is a process where fluid movement is induced by an electric field across a charged surface. This effect occurs due to the movement of counter ions near charged surfaces, coupling liquid transport with an external electric field. It plays a crucial role in geotechnical engineering, soil improvement, microfluidic technologies, and even PCB manufacturing.

ELECTROKINETIC PHENOMENON

It is a phenomenon in which the response of soil water systems to the application of an external electric field includes three predominant components, i.e., electro-osmosis, electrophoresis, and electrochemical reactions. Electro-osmosis generates water flow in soil mass, electrophoresis induces movement of soil solids, and electrochemical reactions lead to the emission of oxygen and hydrogen gases, corrosion of anodes, and pH gradients in soil. Although electrokinetics has been studied for more than a century, the recent advances in anode technology have made electrokinetics a viable tool in geoengineering.

APPLICATIONS IN ENGINEEERING

1) *Soil improvement*—
Electro-osmotic consolidation: In this technique, we stabilise soft clays by reducing moisture content and increasing soil strength. It involves applying an electric field to induce water flow out of the soil, which consolidates and strengthens it.

2) Electrical vertical drains—
They are used as a conjunction with electroosmosis to improve soil properties. EVDs serve as both electrodes and drains, facilitating the removal of water from the soil.

3) *Dehumidification* –
Electroosmosis can be used for dehumidification in building services. By applying an electric field, moisture can be transported out of porous materials, making it a potential energy-saving alternative for industrial dehumidification (talk about railway stations in India)

4)Nanofluidic technologies –
Electroosmosis can be used for dehumidification in building services. By applying an electric field, moisture can be transported out of porous materials, making it a potential energy-saving alternative for industrial dehumidification.

5)Cooling systems –
Electroosmotic pumps are used in cooling systems to transport liquids efficiently. These pumps leverage the effect to move coolant through microchannels, enhancing heat dissipation.

.Contd

ELECTRO OSMOSIS: A MEDICAL BREAKTHROUGH

CHALLENGES AND CONSIDERATIONS

- *Electrode Corrosion:* Traditional metal electrodes used in electroosmosis can corrode, reducing effectiveness and posing environmental concerns; therefore, conductive polymers are being developed as alternatives to address this issue.
- *Complexity of Process*: The electroosmotic process involves changes in mechanical, hydraulic, and electrical properties of the medium, making it challenging to model and predict accurately.
- *Energy Consumption:* The efficiency of electroosmosis can be influenced by the mode of electrification. Techniques like stepped-up voltage can help save energy, while electrode conversion may increase consumption.
- *Material Compatibility*: The effectiveness of EO in PCBs may depend on the compatibility of the PCB materials with the EO process, including the type of insulating material and the presence of any flame retardants or other additives

ELECTROOSMOSIS IN PCB

Soldering Technology---

In surface-mount technology (SMT) assembled printed circuit boards (PCBs), electrochemical migration (ECM) is a well-known phenomenon that can pose a significant reliability risk, especially in lead-free soldering. ECM occurs when metal migrates in ionic form under the influence of an electric field in a humid environment, eventually redepositing and forming conductive pathways.In a PCB, adjacent terminals can act as electrodes, leading to dendritic growth from the cathode to the anode. To study this process, experiments were conducted using a comb-shaped structure printed on an FR4 substrate, with terminal distances of 105 or 254 microns to replicate real-world conditions.

Key parameters such as surface finishing, solder paste composition, terminal spacing, and applied voltage were analyzed, with each experiment repeated twice. The results showed that tin was the primary metal undergoing migration, highlighting the potential risks associated with electrochemical migration in electronic assemblies.

FLEXIBLE PRINTED CIRCUIT

Printed circuit boards for communication equipment have been promoted by mounting circuits in them with higher density. It is said that an ECM (Electro Chemical Migration) generates in the insulating material when a high electric stress is applied to the board material under high temperature with high humidity conditions. Since the ECM degrades the insulation properties of it, it is necessary to use a suitable material to prevent the generation of ECM. However, while much research on the ECM in some traditional rigid circuit boards was carried out, there are few reports about ECM in FPC (flexible printed circuit). Which is usually used in many advanced recent electronic devices. Therefore, we attempted to study the occurrence of the ECM in the FPC.

BENEFITS:

Moisture Management: EO can help in controlling the moisture content within PCBs, which is crucial for maintaining insulation properties and preventing ECM. Improved Reliability: By reducing moisture content, EO can potentially enhance the reliability and lifespan of PCBs by mitigating issues related to conductive filament formation and ECM.

- **SAI KAMAL MUDIGANTI**

TRANSFORMING SURGERY AND REDEFINING SURGICAL PRECISION

Where Robotics, Automation, and Electrical Engineering Meet Medicine

Not long ago, robotic surgery was a futuristic idea found only in science fiction. Today, it is a clinical reality—reshaping how surgeries are performed and how patients heal. By blending robotics, medical science, and electrical engineering, robotic-assisted surgery represents one of the greatest leaps in modern healthcare.

Systems like the da Vinci Surgical System and the ZEUS Robotic Surgical System, both FDA-approved in the early 2000s, opened the doors to a new surgical frontier. With these systems, surgeons perform complex procedures with unmatched accuracy, while patients enjoy faster recovery, fewer complications, and smaller scars.

Why Surgeons and Patients Prefer Robotics

Robotic-assisted surgical systems (RASS) bring distinct advantages over traditional methods:

- For Surgeons: 3D visualization, tremor reduction, stable camera views, and ergonomic console controls that reduce fatigue.
- For Patients: Less pain, reduced blood loss, shorter hospital stays, and quicker returns to daily life.

The benefits are undeniable. However, challenges remain—high costs, limited access, and specialized training requirements that slow widespread adoption.

From Space Labs to Operating Theatres

The story of robotic surgery has roots in unexpected places: space exploration and military research.

- 1970s: NASA and DARPA funded projects to create remote-controlled surgical systems for astronauts and soldiers.
- 1985: The PUMA 560 robot made history with the first robot-assisted brain biopsy.
- 1988: ProBot, developed at Imperial College London, became the first robot for prostate surgery.

The true turning point came in the early 2000s with two systems:

- da Vinci System (Intuitive Surgical): Featured wrist-like robotic arms with wide motion range and a 3D camera for detailed visualization.
- ZEUS System (Computer Motion): Offered three robotic arms with tremor reduction and motion scaling for surgical precision.

Since then, newer platforms like Senhance®, Versius®, and Hugo™ RAS have introduced tactile feedback, modular designs, and advanced imaging to push the field forward.

Redefining Specialties

Robotic surgery has revolutionized several fields:

- Cardiothoracic Surgery: Robotic arms perform CABG (Coronary Artery Bypass Grafting) and valve repairs through small incisions, replacing the trauma of open-heart procedures.
- Urology & Gynecology: Commonly used for prostate and uterine surgeries.
- Neurosurgery: Enables ultra-precise targeting where millimeters matter.

Inside a Robotic Surgical System

At its core, every robotic surgery platform is built around three main components:

1. Surgeon Console – where the surgeon sits, controlling robotic arms with hand and foot controls.
2. Patient-Side Cart – robotic arms equipped with miniaturized surgical instruments.
3. Vision System – high-definition 3D cameras and lighting for magnified visualization.

Together, these components form an advanced feedback loop that enhances human capability without replacing it.

TRANSFORMING SURGERY AND REDEFINING SURGICAL PRECISION

Soft Robotics: The Next Frontier

While traditional robotic systems are powerful, they have limits. Rigid instruments sometimes struggle to access complex anatomical structures like the lungs or bowels.

Enter soft robotics. Built from biocompatible materials such as silicone elastomers, polyurethanes, and hydrogels, these flexible robots can adapt to the body's complex geometries. They represent the future of safe, minimally invasive navigation inside the human body.

The Electrical Engineering Connection

Electrical engineering lies at the heart of surgical robotics—especially through sensors.

Sensor Type	Functionality	Application
Force/Torque Sensors	Measure joint torque for motion control	Precision in robotic arms
Tactile Sensors	Provide ultra-sensitive feedback	Handling delicate tissues
Impedance Sensors	Differentiate healthy vs diseased tissue	Tumor localization
Optical Sensors	Capture high-resolution images	Real-time imaging
Temperature Sensors	Monitor heat levels	Prevent laser overheating

Without these sensors, robotic systems would lack awareness of their environment—limiting their safety and effectiveness.

How Robots Move: Actuation in Action

Soft and traditional surgical robots rely on innovative actuation methods:

- Cable-driven propulsion
- Pneumatic and hydraulic actuators
- Shape Memory Alloys (SMAs)
- Magnetic actuation
- Robotic guidance along predefined surgical paths

These mechanisms give robots the ability to move with precision and flexibility inside delicate human anatomy.

Looking Ahead: Surgery in the Age of AI

Robotic surgery has already proven its worth, but the future promises even more. Advances will bring:

- Enhanced haptic (touch) feedback for surgeons
- AI-powered decision support during procedures
- Affordable, modular systems for broader access
- Hybrid models blending robotic precision with surgical expertise

The operating room of tomorrow won't replace surgeons—it will empower them with intelligent robotic partners.

From its origins in space research to its dominance in modern hospitals, robotic surgery is one of the most striking unions of engineering and medicine. It delivers faster recovery, greater precision, and a new standard of care. As robotics, sensors, and AI advance, surgery will not lose the human touch—it will be enhanced by technology.

ENGINEERING THE FUTURE: STUDENTS POWER UP ELECTRIC MOBILITY AT ELGI TECHNOLOGY DAY

At ELGi Technology Day 2024, two dynamic student teams from our department showcased groundbreaking innovations in motor technology—each aimed at revolutionizing electric mobility. Their mission? To push the boundaries of power density and performance in electric motors, making them lighter, faster, and more efficient.

🔧 ***Team 1:*** **Speed Meets Precision with BLDC Innovation**

Sarveshwaran, Thomas Jefferson, Hrithik, and Kowsik, mentored by Dr. Ilango Karuppasamy and Dr. P. Kanakasabapathy, tackled a challenge central to electric vehicles: how to enhance power output without compromising torque. Their solution? A reimagined Brushless DC (BLDC) motor design that blends speed control algorithms with advanced hardware.

Their approach included:

- **Pole Pair Reduction for speed enhancement**
- **Multiphase BLDC Design to reduce torque ripple**
- **Field-Oriented Control (FOC) for precise magnetic field alignment**

The result? A compact motor with improved thermal management and smoother performance—ideal for high-speed compressors and EV applications.

ENGINEERING THE FUTURE: STUDENTS POWER UP ELECTRIC MOBILITY AT ELGI TECHNOLOGY DAY

⚙ Team 2: Designing the Future with PMSM Power Density

Dixita and Vishveshwaran, guided by Dr. K.R.M. Vijaya Chandrakala, focused on developing a Permanent Magnet Synchronous Motor (PMSM) with a staggering power density of 5 kW/kg. Their research combined simulation, material science, and magnetic geometry optimization.

"We wanted to build a motor that's not just powerful, but also scalable and sustainable," said Dixita.

Their journey unfolded in three phases:

1. Dimension Optimization using Finite Element Analysis (FEA)
2. Material Innovation with high-grade magnets and lightweight alloys
3. Magnetic Geometry Exploration—from surface-mounted to V-shaped topologies

The team's final design featured liquid cooling, reduced torque ripple, and a significant weight reduction—making it ideal for electric trains, buses, and even screw compressors.

The team have achieved the highest honour in the Technical Presenter Award at the same, 7th Annual ELGi Technology Day, held recently at Le Meridien.

"Development of Indigenous High-Power Density (5kW/kg) Permanent Magnet Synchronous Motor (PMSM) for Electric Mobility Applications," was recognized as one of the top three concepts among submissions from leading engineering institutions.

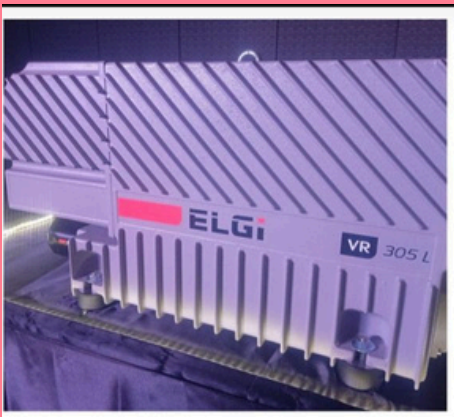
The competition, which involved three rigorous rounds of evaluations, showcased innovative and cutting-edge concepts from young engineers and their mentors, demonstrating the strong emphasis on research and innovation at Amrita. The event featured contributions from renowned industry leaders, including Venu Madhav, Director, Product Excellence and Innovation, ELGi; Jairam Varadaraj, Managing Director of ELGi; Prabhakaran, Vice-President of Volvo Penta Industrial; Rohit Pandita, Vice-President of Tor-ai; and Debanshu Roy, Principal Engineer, SKF Engineering and Lubrication India Pvt Ltd.

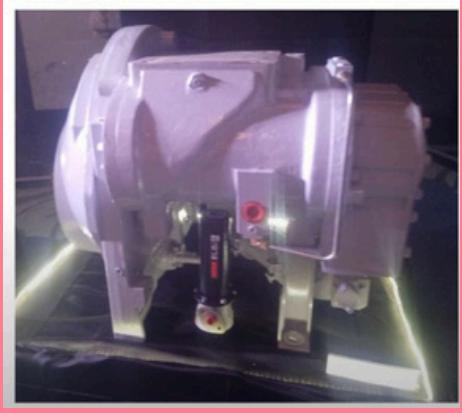
The day also included a product launch and insightful discussions on future innovations in the engineering field.

ENGINEERING THE FUTURE: STUDENTS POWER UP ELECTRIC MOBILITY AT ELGI TECHNOLOGY DAY

From Lab to Legacy:
Both teams emphasized the importance of collaboration, mentorship, and hands-on experimentation. Their work not only impressed the ELGi panel but also inspired peers and industry professionals.
"*It's not just about motors,*" said Hrithik. "*It's about solving real-world problems with engineering.*"

The Road Ahead:
With their eyes set on future applications—from smart compressors to sustainable transport—these students are redefining what's possible in electrical engineering. Their projects stand as a testament to innovation, grit, and the power of academic-industry synergy





MSME Women Idea Hackathon 3.0

~National Recognition for Solar-Powered Cold Storage Innovation

The team from the Department of Electrical and Electronics Engineering, Amrita School of Engineering, achieved a remarkable milestone with their idea being selected at the national level under the MSME Innovative Scheme by the Ministry of Micro, Small & Medium Enterprises (MSME), Government of India, New Delhi.

The MSME Ministry plays a pivotal role in fostering innovation and entrepreneurship among micro, small, and medium enterprises, which form the backbone of India's economy. Through the MSME Innovative Scheme, the government provides financial support and incubation facilities to transform groundbreaking ideas into viable business ventures, particularly those addressing critical societal challenges.

The project, titled "Solar-Powered Cold Storage for Perishables: An Affordable Pick Empowering Small Farmers" (IDEATNO15898), was among only 397 innovative ideas approved during the 7th Project Monitoring and Advisory Committee (PMAC) meeting held on February 15, 2024. The selection was officially announced by the Hon'ble Minister of MSME during the CPSE Conclave at Vigyan Bhawan, New Delhi, on February 29, 2024.

The all-women winning team comprised Vrindha Venugopal K. V. (Research Scholar), Dr. K.R.M. Vijaya Chandrakala (Associate Professor), Dr. R. R. Lekshmi (Assistant Professor (SG)), and Anu Kuriakose (Research Scholar). Their achievement exemplifies women's leadership in STEM innovation, aligning with initiatives like various government-sponsored women hackathons that encourage female researchers and entrepreneurs to tackle real-world problems through technology.

The team developed a sustainable, solar-powered cold storage system designed to minimize post-harvest losses—a critical issue affecting Indian agriculture where nearly 16% of fruits and vegetables perish before reaching markets. By providing affordable preservation technology, this innovation directly empowers small and marginal farmers, enhancing their income stability and reducing food wastage. The system integrates renewable energy with efficient thermal management, making cold storage economically accessible to farmers who traditionally lack such infrastructure.

Campus Chronicles: Where Memories Major too

We were all told that college would be fun. So, we stepped into this campus as a teen, with bags full of hopes, dreams and a longing to create memories we would carry to the grave.And we would exit as an adult, who is self sufficient in creating his/her life.

So what happens during this period of transition?

We meet people from all walks of life, some ignite the spark of youth in you, some may impart knowledge that would be used in places you never expect, while some make you question your ideologies and force you to rebuild your identity.

Amrita as a campus would have bewitched you with its lush green scenery and an enthralling backdrop of mountains and mist. Not to mention it serving as a home to various species, like the warm embrace of a mother. But what goes beyond the breathtaking beauty of this green carpet?

Hustle, hustle and more hustle.

From skipping meals to pulling all-nighters, we did all we could to keep up. Slowly tip toeing our way to classrooms during prayers so that we aren't late, rushing to get our manuals printed and bound just in time for the due. The excruciating attention to details while drawing circuits, the calculation errors that would surprisingly arise within the same group and the nervousness while picking the lab endsem question from the lot, just to end up choosing the only experiment that we aren't thorough of. The prolonged late night talks that either end up as ideas for projects or futile gossips.

The late night extensions that we long for just so we could take some extra stroll around the campus. The 'On Duties' are our golden ticket to extend our experiences, besides academics, from displaying our skill sets in hackathons to getting our uniforms stained while painting for Gokulashtami in the corridors.

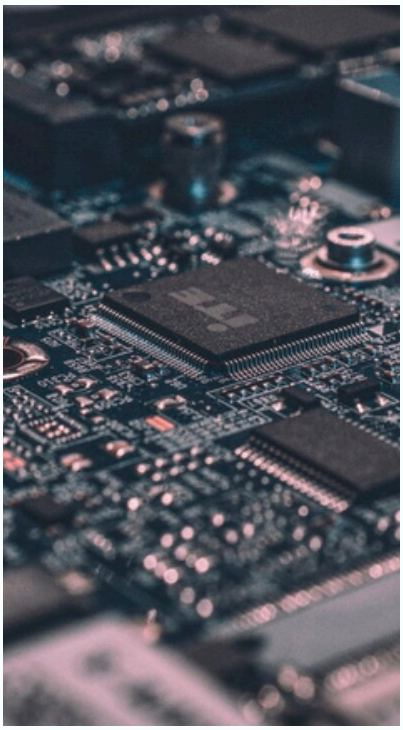
There is a pulsating wave of untamed liveliness that echoes thoroughout the campus walls during fests. The synergy of the performers' passion and the non-performers' motivation during the Gokulashtami procession is what makes the department stand-out.

Be it a victory or a defeat, Gokulashtami always ends with powerful beats of Dhol and Chenda that reverberates across AB2.

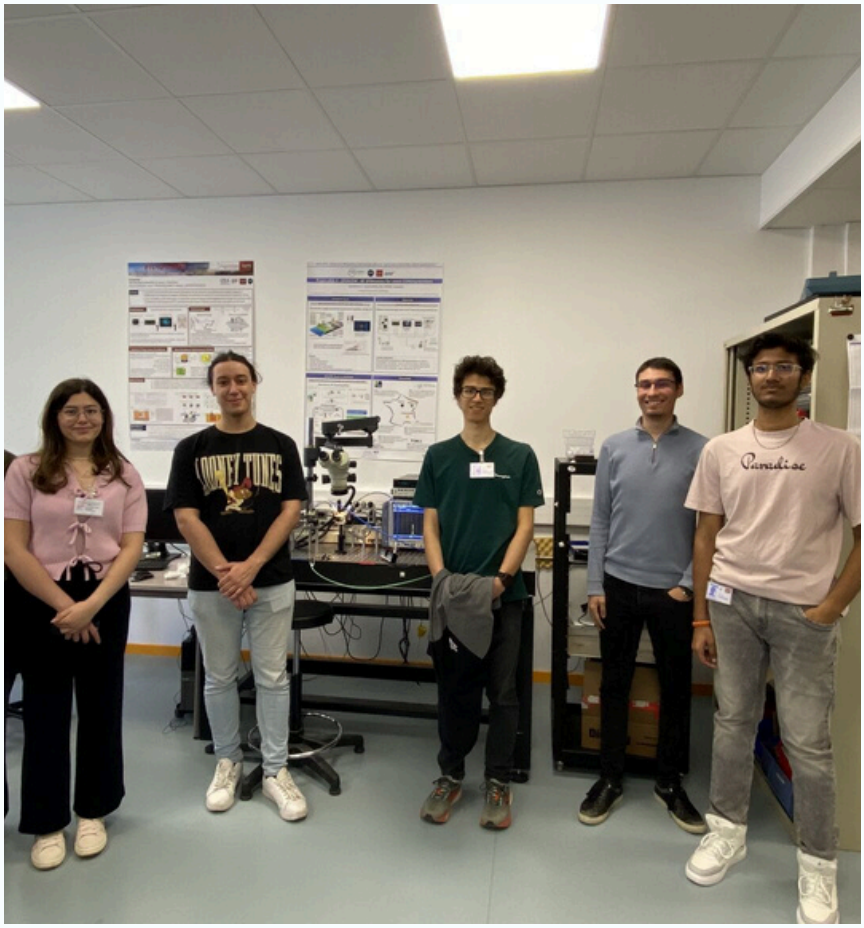
All of this act as a catalyst in moulding us into responsible adults who are capable of handling hurdles that life may throw our way. If there is one thing that can be said with utmost certainty, it is that college life doesn't just help you grow with success stories but also with acceptance of failures. These failures will humble you in ways that you could never have imagined. Amrita, with its holistic ways of teaching, instills in us the strength and wisdom needed to become better human beings.

ACADEMIC ENRICHMENT THROUGH ERASMUS

A Semester at Grenoble INP – PHELMA



As a B.Tech student in Electrical and Electronics Engineering at Amrita Vishwa Vidyapeetham, I had the privilege of participating in the Erasmus student exchange program at Grenoble INP – PHELMA, France. This opportunity, facilitated by my home university, enabled me to spend a semester immersed in an international academic environment renowned for its excellence in science and engineering. During my time at PHELMA, I engaged in advanced coursework covering topics such as Sustainable Nanoelectronics, Advanced CMOS Process Integration, and Microsystems Technologies, which broadened my understanding of interdisciplinary applications in modern electronics and nanotechnology.



The experience was transformative both academically and personally. Being part of a diverse student community enhanced my adaptability, communication skills, and cultural awareness. Access to high-end research facilities and exposure to a global perspective on engineering challenges enriched my learning beyond the classroom. This exchange program has significantly contributed to my academic growth and professional outlook, and I am deeply grateful to Amrita Vishwa Vidyapeetham for enabling this opportunity, which I consider a milestone in my educational journey.

Gururaghuram S

LILA: WHERE LEARNING MEETS LIFE

In a world where education often remains confined to classrooms and labs, the Amrita Live-in-Labs® (LILA) program dares to break the boundary between theoretical learning and lived experience. Established in 2013, LILA is a multidisciplinary experiential learning initiative by Amrita Vishwa Vidyapeetham that immerses students in the realities of rural India, encouraging them to observe, understand, and act.

This isn't just a field visit. It's an opportunity to live, learn, and work hand-in-hand with communities that face challenges in areas like health, energy, water, waste management, agriculture, gender equality, and climate resilience. It is education at its most raw and real, offering a platform for youth to engage directly with the pulse of rural India.

This year, our EEE students, guided by:

1. Dr. Ilango Karuppasamy
2. Dr. S. Sampath Kumar
3. Dr. Anu G. Kumar
4. Mr. Balakrishnan P

Their destination: Rameshwaram and its surrounding villages including Sathya Nagar, Kalaignar Nagar, and several others. Over days and weeks, they witnessed firsthand the intricacies of village life — the ingenuity, the struggles, the traditions, and the aspirations.

Before setting foot in the villages, the students underwent an orientation program — preparing them for the cultural sensitivities, the communication nuances, and the importance of humility and listening. Once in the field, they either joined existing on-ground projects or took up the challenge of identifying new problems and framing sustainable, scalable solutions.

What sets LILA apart is the emphasis on mutual learning. It's not just students offering solutions; it's communities teaching lessons in resilience, resourcefulness, and real-world problem-solving. Living with the villagers, sharing meals, walking the same dusty paths, and listening to their stories gave students a perspective no textbook could offer.

Whether it was exploring ways to improve energy access using renewable solutions, understanding the dynamics of local agricultural practices, or identifying gaps in sanitation infrastructure, every activity was driven by one purpose — to develop affordable, practical, and impactful solutions that the village could own and sustain.

At the end of their stay, students compiled their insights and outcomes into a comprehensive report and gave presentations to Amrita faculty. But perhaps the true learning was in the hearts and minds transformed, in the bridges built between knowledge and compassion, and in the quiet but powerful realization that technology means nothing without human connection.

THE UNIQUE EXPERIENCE

LILA is more than a program. It is a movement — one that cultivates not just engineers, but empathetic innovators, global citizens, and responsible changemakers.

The depth and rigor of the LILA 2024-25 program is evident in the diversity of projects undertaken by the student teams. Seventeen students from the Department of Electrical and Electronics Engineering, across both EEE and ELC streams, engaged with critical social and infrastructural challenges under the mentorship of faculty members including Dr. P Geetha, Dr. Saravanan R, Mr. Balakrishnan P, Dr. Anu G Kumar, Akhil V M, Dr. N. Radhika, Dr. Ilango Karuppasamy, and Dr. Sampath Kumar S.

The Alchemists team, under Dr. P Geetha's guidance, investigated "Open Defecation due to lack of maintainence of toilets," addressing one of the most pressing sanitation challenges in rural areas. The Eco Prism team, with Pranaveesha RM and Namitha Madhu mentored by Dr. Saravanan R, focused on "Defunt toilets caused due to high water table," exploring the intersection of water management and sanitation infrastructure.

Under the Gram Nexus banner, guided by Mr. Balakrishnan P, took on the critical issue of "Open Defecation- Threat to Women's safety and privacy," highlighting the gender dimensions of inadequate sanitation.

The Gram Udan team, under Dr. Anu G Kumar's mentorship, examined "Persistent income deficit forces low-income households to skip meals to meet essential expenses," revealing the harsh economic realities faced by vulnerable families.

The Synergy team, mentored by Akhil V M, investigated "Inaccessability of clean drinking water," while KOWSIK S from TEAM AVINYA, under Dr. N. Radhika's guidance, explored "Financial instability due to irregular income sources."

The Tvishara team addressing different facets of water access and quality, specifically mentored by Dr. Ilango Karuppasamy, worked on "Improving Drinking Water Quality."

Finally, the Sustainovators team under Dr. Sampath Kumar S's guidance — delved into the behavioral and developmental aspects with their study on "Abnormal behaviour of kids," examining the psychological and social factors affecting children in rural communities.

Each team meticulously documented their findings, methodologies, and recommendations, culminating in detailed publications that now serve as valuable resources for future interventions and academic discourse. These reports are more than academic submissions — they are testimonies of empathy translated into action, of data grounded in lived realities. Together, these seventeen students didn't just visit villages; they became chroniclers of hope, advocates for change, and architects of sustainable solutions rooted in dignity and respect.

The work done by the LILA 2024-25 cohort is not an endpoint but a beginning. The seeds planted in Rameshwaram — of awareness, collaboration, and grassroots innovation — will continue to grow long after the students return to their campuses. The relationships forged, the problems identified, and the solutions proposed form part of a living archive of engaged scholarship that future batches will build upon. Year after year, new students will walk these same paths, listen to new stories, encounter evolving challenges, and contribute their own chapters to this ongoing narrative of change. This is the beauty of LILA: it is a legacy in motion, a torch passed from one generation of changemakers to the next, ensuring that the spirit of service, humility, and innovation remains alive. As long as there are villages waiting to be heard and students willing to listen, this legacy will continue — one village, one student, one solution at a time.

EMPOWERING WOMEN LEADERS

A Day at Bosch's Women's Day Event

On Women's Day 2025, six students from the EEE and ELC departments—Suchita, Subashree, Paroma, Pallavi, Kanishka, and Pavitra—attended an inspiring event at Bosch that highlighted the significance of women in leadership roles. The event combined powerful speeches, engaging workshops, and meaningful discussions, offering the students a unique opportunity to learn about overcoming challenges and building a successful career.

One of the most impactful parts of the event was a panel discussion with women leaders from Bosch. They shared their personal journeys, discussing the barriers they faced and how they persevered. Pallavi was particularly inspired by the message that perseverance and attitude are key to overcoming obstacles in any career. "It was motivating to hear their stories of overcoming challenges," she said.

The students also participated in interactive workshops that encouraged them to reflect on their goals and aspirations. One such activity, the "impromptu speaking," challenged the students to quickly think on their feet and envision themselves in leadership positions. They were asked to speak about what the world would be like if women were in charge of all leadership roles. This exercise not only encouraged them to imagine themselves as future leaders but also helped them realize the power of their voices in shaping their careers and the world around them. Pavitra found this exercise eye-opening, emphasizing how important it is to build a career outside of just technical skills.

One story that resonated with the group was about a Bosch employee who won the Employee of the Year award. She shared how she dedicates her time after work to personal growth, attending Mridangam classes, working on personal projects, and mentoring others. This message of constant self-improvement left a lasting impact on the students. "Her story showed us that work isn't just about what we do during office hours—it's about how we continue to grow outside of it," said Subashree.

The event also allowed the students to network with other participants and women in the industry, broadening their perspectives. Paroma enjoyed connecting with people from various backgrounds, appreciating how the event encouraged self-reflection and goal-setting.

By the end of the day, the students were not only inspired by the women leaders but also by the supportive, interactive environment at Bosch. "It was a great reminder that women can be leaders in any field," said Kanishka. The event left the group feeling motivated and ready to pursue their careers with renewed confidence and determination.

The experience was both empowering and fun, and the students highly recommend similar events to others. "It wasn't just technical learning; it was about personal growth and making connections," said Pavitra. This Bosch Women's Day event reminded everyone that leadership is not just about a title, but about the continual effort to better oneself and empower others along the way.

Testimonial and Report

3+2 program in University of Twente

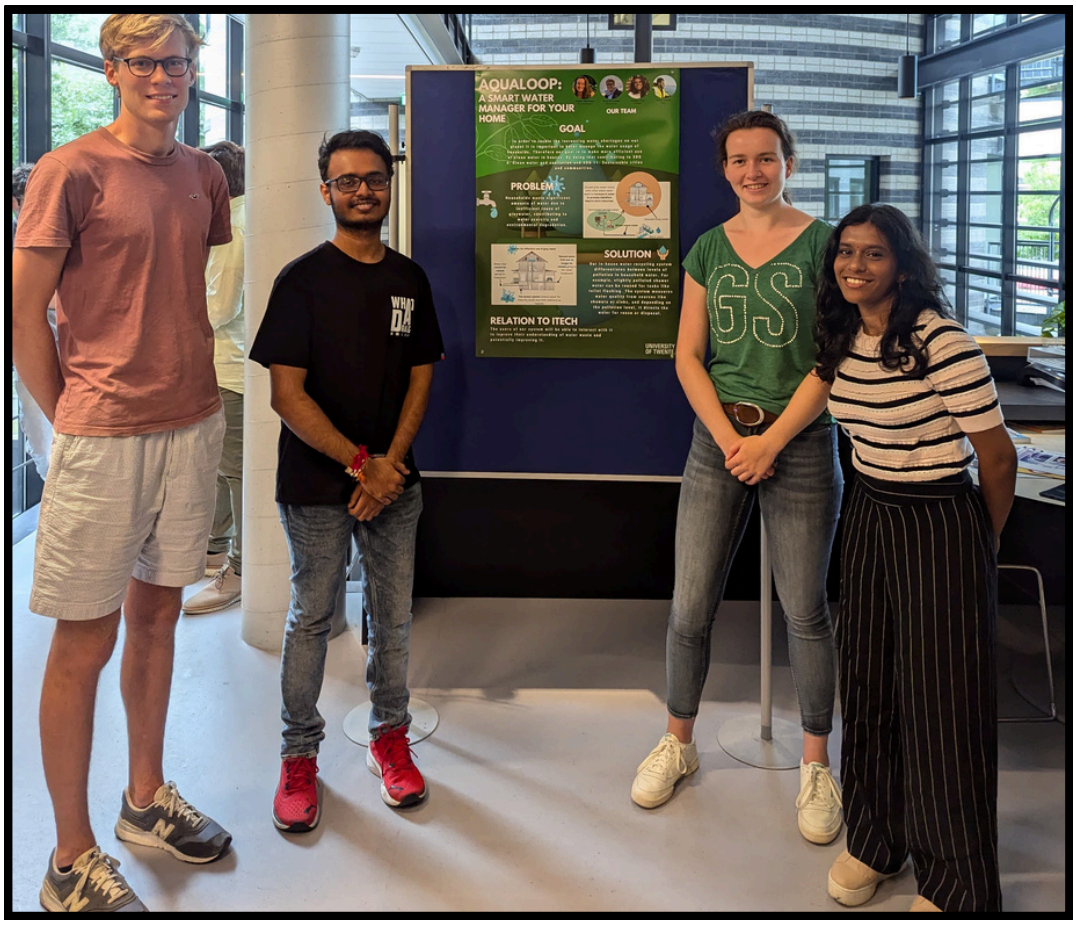
As part of the 3+2 dual-degree program between Amrita University, Coimbatore and the University of Twente, I had the unique opportunity to pursue my Master's in Interaction Technology in the Netherlands. This experience has been one of the most transformative chapters of my life—both academically and personally.

The Interaction Technology program at Twente offered a rare blend of theory, creativity, and hands-on innovation. I was able to work on a variety of interdisciplinary projects that truly embodied the spirit of human-centered design and intelligent systems. Some of the most exciting projects I participated in included:
• Designing and programming Social Robots that could interact meaningfully with users in various contexts.
• Building autonomous robot cars, incorporating computer vision and control systems to simulate real-world driving conditions.
• Developing Natural Language Processing (NLP) and Deep Learning applications, where I explored advanced AI models and language technologies.

These projects not only sharpened my technical skills but also taught me how to approach design from a systems and user-experience perspective—key to building technologies that truly matter.

Beyond academics, my time in the Netherlands was equally enriching on a personal and cultural level. Living in a multicultural student environment exposed me to a rich variety of perspectives, lifestyles, and traditions. I formed friendships with people from all over the world, shared meals from different cultures, and had countless late-night discussions that broadened my worldview.

I also made the most of my time outside the classroom—exploring beautiful Dutch cities, biking through scenic trails, attending cultural festivals, and experiencing the warmth and inclusivity of Dutch society. Whether it was team outings after a successful sprint, international student nights, or simply cooking with friends in shared student housing, every moment added to the experience in its own way.



Coming from Amrita University, the transition to an international academic environment came with its challenges, but it also brought immense growth. The supportive faculty, strong research culture, and freedom to experiment allowed me to push boundaries, collaborate across disciplines, and discover new passions.

This program not only advanced my skills in interaction design, robotics, and AI but also helped shape me as a global thinker—more confident, curious, and ready to contribute to technology that improves lives. I'm deeply thankful for the opportunity to be part of this journey and would wholeheartedly recommend the 3+2 program to anyone looking to combine strong technical education with international exposure and personal growth.

-Sumit Kundu
CB.EN.U4ELC21061

Testimonial and Report

Student Exchange Program at Tampere University, Finland

My exchange semester at Tampere University, Finland was a deeply rewarding experience, both academically and personally. It gave me the opportunity to explore the field of business with technology in an international and research-oriented setting, helping me better understand the role of innovation, strategy, and data in shaping global business landscapes.

The academic environment at Tampere was of high quality, with well-structured courses led by experienced professors who combined theory with real-world relevance. I engaged in project-based learning across key areas such as supply chain management, strategic knowledge management, international business law, and marketing and sales. These projects allowed me to work on real-life business problems, collaborate with international peers, and develop practical solutions

What made the experience truly exceptional was the vibrant student culture at Tampere University. The campus fostered a strong sense of community, openness, and collaboration.

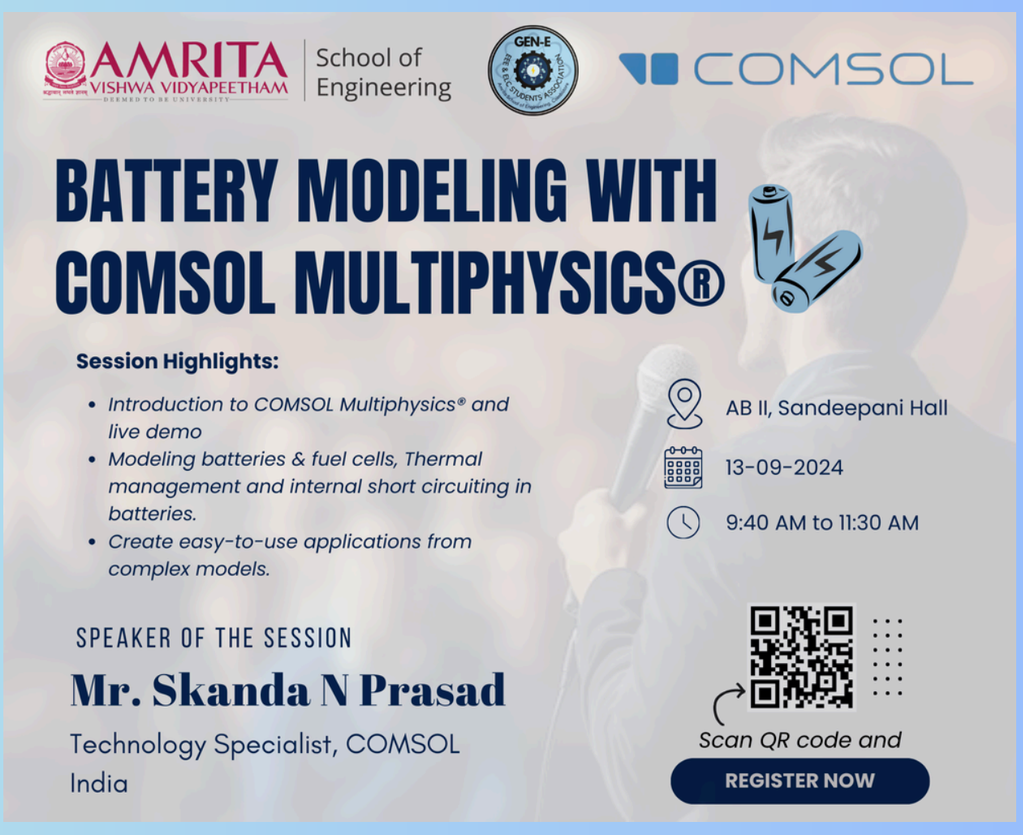
From student-led events and organizations to informal gatherings and support systems, the university offered a lively and inclusive environment where learning extended well beyond the classroom. Interacting with students from different parts of the world, each with unique backgrounds and experiences, greatly enriched my personal growth and global perspective.

This exchange semester not only enhanced my academic skills and cross-cultural communication but also gave me the confidence to pursue interdisciplinary learning. The combination of academic excellence, global exposure, and a dynamic student culture made my time at Tampere University a transformative chapter in my academic journey.

--MEHUL SHARMA
CB.EN.U4ELC21037

EVENTS UNDER GEN-E

Archives



AMRITA VISHWA VIDYAPEETHAM
DEEMED TO BE UNIVERSITY
School of Engineering
Department of Electrical and Electronics Engineering

Adieu 2025

Agenda

10:00 AM - 10:15 AM	Lighting the Lamp
10:15 AM - 10:25 AM	Welcome Address by Dr. Jayabarathi R
10:25 AM - 11:00 AM	Batch Co-ordinators' and Class Advisors' Address; Introducing New Office Bearers: 2025-26; Certificate Distribution by Dr. K C Sindhu Thampatty and Dr. P Supriya
11:00 AM - 11:20 AM	Presidential Address by Dr. S Balamurugan, Chairperson, Department of EEE
11:20 AM - 12:30 PM	Electro Events Marathon
12:30 PM - 12:35 PM	Vote of Thanks

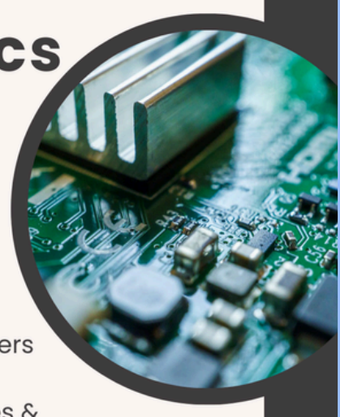
Saturday, 29 March 2025
10:00 AM to 12:30 PM

See you all at
Amriteshwari Hall

AMRITA VISHWA VIDYAPEETHAM
DEEMED TO BE UNIVERSITY
School of Engineering
Department of Electrical and Electronics Engineering

ONE DAY WORKSHOP ON

Embedded Systems for
Power Electronics Applications



Key Takeaways:

✅Understanding of embedded systems in power electronics
✅Hands-on experience with microcontrollers in power applications
✅ Insights into electric vehicle technologies & energy storage

Workshop Details:

Date : 8th March 2025
Time : 9:00 AM - 4:00 PM
Venue : Sandeepani Hall, AB2

Who can attend?
Final Year B.E/B.Tech (EEE, ECE, ICE, Mechatronics) Students

Workshop Co-ordinators:

Dr. S. Sampath Kumar
Asst Professor (Sl Gr), Dept of EEE | +91 99943 59814
Dr. C. P. Boopathy
Asst Professor (Sl Gr), Dept of EEE | +91 97501 27828

₹ Registration Fee: Rs. 250

Register here

AMRITA VISHWA VIDYAPEETHAM
DEEMED TO BE UNIVERSITY
Coimbatore Campus

DATA ACQUISITION
for Electrical Engineering
USING IoT

Workshop details:

24 OCTOBER 2024
2:00 PM - 5:00 PM
AB-II C-307, Power Systems Lab

REGISTER NOW

Scan to apply

Workshop highlights:

- Introduction to IoT-based data acquisition
- Hands-on session with real-world systems
- Certificate of participation

GEN-E IEE & ELC STUDENTS' ASSOCIATION
AMRITA VISHWA VIDYAPEETHAM
DEEMED TO BE UNIVERSITY
School of Engineering
FLUKE

1 DAY WORKSHOP ON

Latest Solutions from Fluke for Solar and EV Applications

Presenter

Mr. Girish Ramamoorthy
Manager, Fluke Technologies Pvt Ltd, Bangalore

Convener

Dr. S. Selvakumar
Associate Professor, Department of EEE, ASE, Coimbatore

Workshop Details

Date : 28-01-2024
Time : 11:30 AM to 4:30 PM
Venue : Controls and Instrumentation Lab, AB2, ASE Coimbatore

Demo Unit Details

- EV Charging Station Test Kit - FEV 350
- Power Quality Analyzer - 1777
- Acoustic Imager - ii900
- MDA 550
- 393 Clamp Meter
- 283 Multimeter
- Battery Analyzer - BT521
- PV & IV Curve Analyzer - SMFT1000

Our Mentors

Our mentors have been our guiding light from the very start. Their unwavering support and invaluable guidance have paved the way for everything we have achieved.

Dr. Balamurugan S

Chairperson & Professor

Dr. Jayabarathi R

Vice-Chairperson & Associate Professor

Dr. Selvakumar S

Vice-Chairperson & Associate Professor

Dr. Ilango Karuppasamy

Associate Professor

Dr. Kavitha D

Associate Professor

Office bearers (2024-2025)

Core Team

President
B Pavan Kumar

Vice President
Katikaneni Anuj Kishan

Joint Secretary
Satuluri Sai Ramanuja Kamal

Joint Secretary
Seethalakshmi I

Treasurer
Animireddi Samanvay Kumar

Lead Executive
Aakash Sriram

Executive Team

Content Lead
Vishnuvarthan L

Content Co-lead
Rithani K G

Event Planning lead
Annapragada Tapaswin Radha Krishna

Public Relations lead
Swetabh Singh

Special Interest Group Lead
Electric Vehicles
Vishruth Gouda H

Event Planning Co-lead
Sayooj Ramachandran

Public Relations Co-lead
Nakkala Deepak Reddy

Special Interest Group Lead
Internet of Things
Visham Kumar V

Special Interest Group Lead
Robotics and Automation
Devisree Sumesh

IT Coordinator
Jayadharshni P S

Design Lead
Adith P

Alumni Relations Coordinator
Abinaya R

IT Coordinator
Pranav Karthikeyan

Design Co-lead
Pavitra A

Contribute your content

Would you like to have your articles, reader reviews, achievements or opinions published?

We enthusiastically encourage content related to technical or allied subjects.

Submit your content/ achievements to
gen_e@cb.amrita.edu
Get the spotlight you deserve in GEN-E's upcoming publications.

@gen_e.aeee

gen_e@cb.amrita.edu