



Vel Tech
Rangarajan Dr. Sagunthala
R&D Institute of Science and Technology
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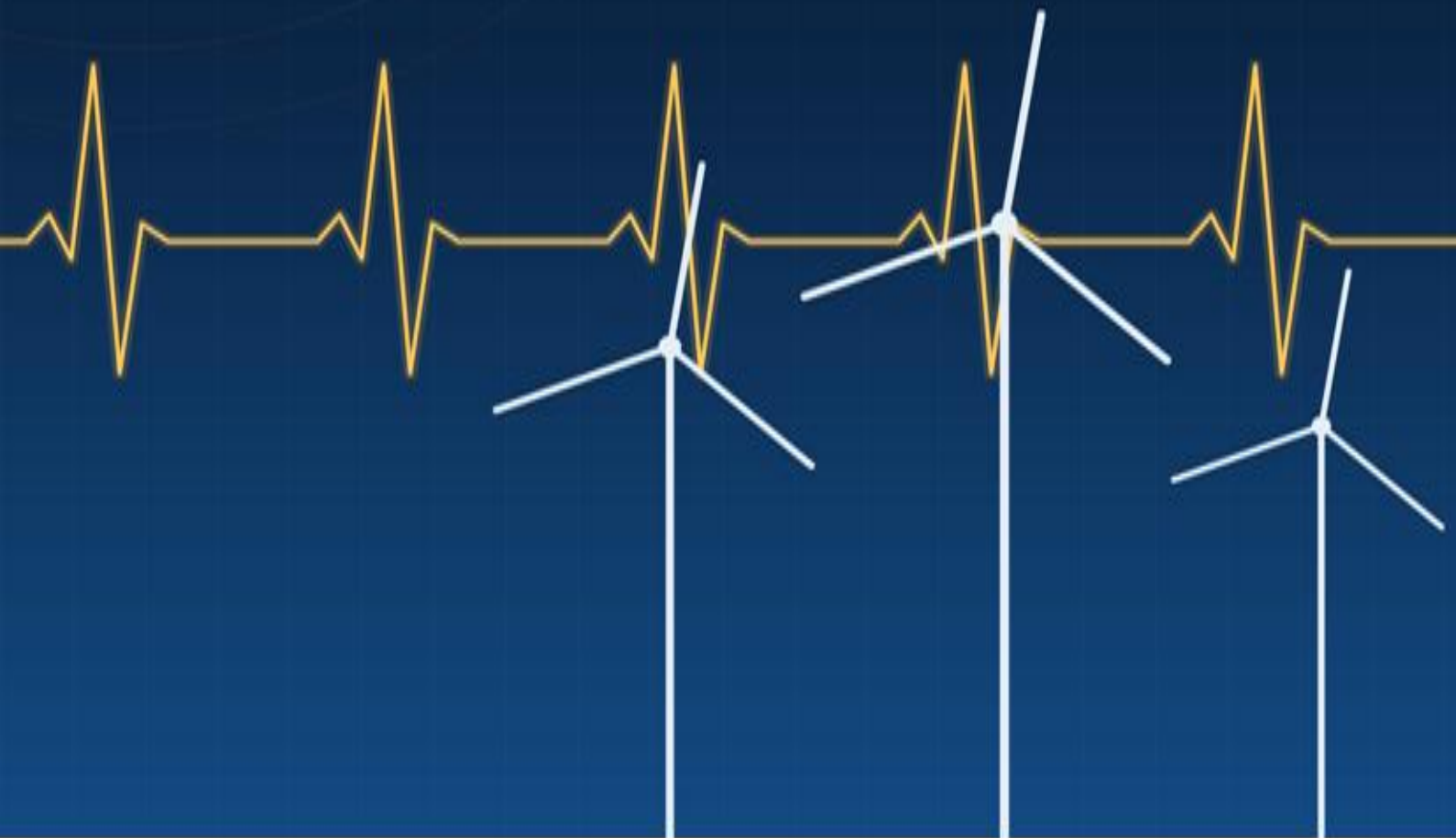
SCHOOL OF ELECTRICAL AND COMMUNICATION

**DEPARTMENT OF
ELECTRICAL AND ELECTRONICS ENGINEERING**

Spark Magazine

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Foreword



Col. Prof. Vel. Dr. R. Rangarajan
Founder President & Chancellor



Dr. Mrs. Sagunthala Rangarajan
Foundress President

We remain committed to building an educational environment that nurtures knowledge, character, innovation, and excellence. Our institution continues to encourage students and faculty to pursue meaningful academic, research, and technological endeavors, supported by modern infrastructure, well-equipped laboratories, and a dedicated faculty. The Department of Electrical and Electronics Engineering reflects this vision through its academic achievements, research initiatives, funded projects, industry collaborations, and the accomplishments of its students and faculty.

LEADERSHIP



Dr. Rangarajan Mahalakshmi Kishore
Chairperson & Managing Trustee

I am delighted to present this vibrant edition of SPARK, the magazine of the Department of Electrical and Electronics Engineering. This magazine reflects the department's academic excellence, student contributions, innovative initiatives, and technical achievements. As technology continues to evolve, I encourage students and faculty to embrace lifelong learning, explore emerging technologies, and apply their knowledge to address real-world challenges. I congratulate the editorial team and the entire EEE department for their dedicated efforts in bringing out this edition and showcasing the department's accomplishments and vision.

Wishing SPARK continued success in inspiring innovation, creativity, and excellence!



LEADERSHIP



Prof. S. Salivahanan
Vice Chancellor

I am delighted to present the latest edition of Spark, the flagship magazine of the EEE Department. This magazine reflects our continuous pursuit of research excellence, creativity, co-curricular activity and technical learning of our students. Kudos to the editorial team, faculty, and brilliant students whose hard work and contributions made this edition possible.



Prof. Dr. E. Kannan
Registrar

I warmly congratulate the EEE Department on launching this vibrant edition of Spark. This platform beautifully captures the dynamic activities, student achievements, and academic excellence of the department. I wish the EEE team continued success in inspiring our community through such creative and meaningful initiatives.



Message from Dean and Head of the Department

Dr. R. S. Valarmathi

Professor & Dean
School Of Electrical and Communication



The School continues to make remarkable progress, driven by the achievements of our faculty, students and staff in cutting-edge research, academic excellence, and industry collaboration. Spark, the magazine of EEE department serves as a wonderful window into this journey—reflecting our focus on innovation, hands-on learning, and community impact. I commend the entire team for shaping our students into future-ready professionals and bringing these milestones to light.

Dr. S. Ramesh

Professor & Head
Department of Electrical and Electronics Engineering



It is with great pleasure and a deep sense of pride that to present the SPARK-Magazine of the Department of EEE. I encourage you to delve into the pages of this magazine to gain a deeper understanding of the remarkable work that has taken place within our department. Together, we can look forward to an even brighter future filled with groundbreaking research, transformative education, and meaningful contributions to the field of electrical and Electronics engineering.

VISION OF THE DEPARTMENT

To provide intellectual curiosity in the field of Electrical and Electronics engineering that produces skilled interdisciplinary engineers to serve the society.

MISSION OF THE DEPARTMENT

M1: To inculcate knowledge among the students through comprehensive curriculum.

M2: To enrich the academic experience in terms of flexibility, teamwork, design skills, practice and industrial trainings.

M3: To produce competent graduates suitable for a successful career in Industry and Research.

PROGRAMME EDUCATIONAL OBJECTIVE

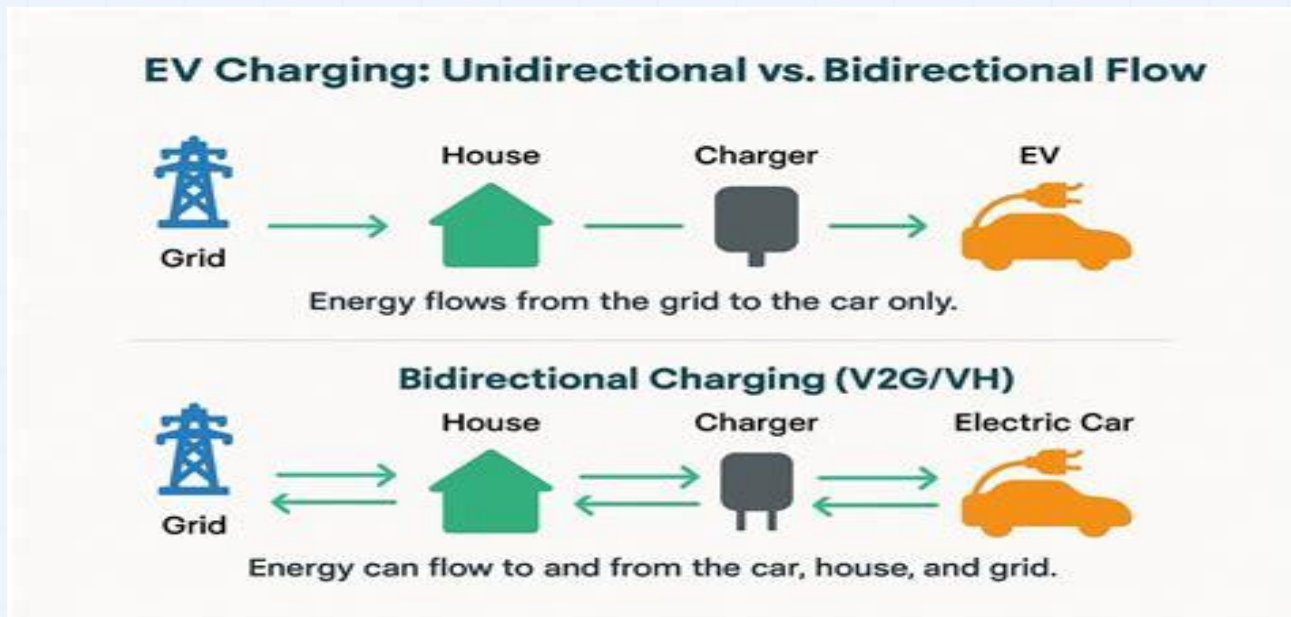
PEO1: Design and analyse electrical and electronic systems by applying the knowledge of mathematics and engineering.

PEO2: Provide practical solution to multidisciplinary societal problems through innovative ideas.

PEO3: Secure positions and continue as valued, creative and proficient employees in a wide variety of fields and industries for a rewarding career.



Vehicle-to-Grid (V2G) Technology



Vehicle-to-Grid: A New Role for Electric Vehicles

Vehicle-to-Grid (V2G) technology changes the role of an electric vehicle from simply being a consumer of electricity to becoming a temporary energy-storage unit for the electrical grid. When an EV is parked and connected to a V2G-compatible charging station, its battery can store electricity when supply is high and return some of that energy to the grid when demand increases. A smart energy-management system determines the appropriate charging and discharging time based on electricity demand, renewable-energy generation, battery condition, and the driver's requirements. V2G can be particularly useful for integrating solar and wind power because renewable generation varies throughout the day. For example, an EV can charge using excess solar energy during the afternoon and potentially supply electricity during the evening peak-demand period. The technology can also support frequency regulation, peak-load reduction, emergency backup, and improved utilization of renewable energy. However, widespread implementation requires suitable bidirectional chargers, communication systems, grid standards, and methods for managing battery ageing. As EV adoption increases, coordinated V2G systems could connect thousands of vehicle batteries and create a flexible distributed energy-storage network.

VTU21385 SANDHIYA



High-Voltage Transmission: Building the Grid of Tomorrow

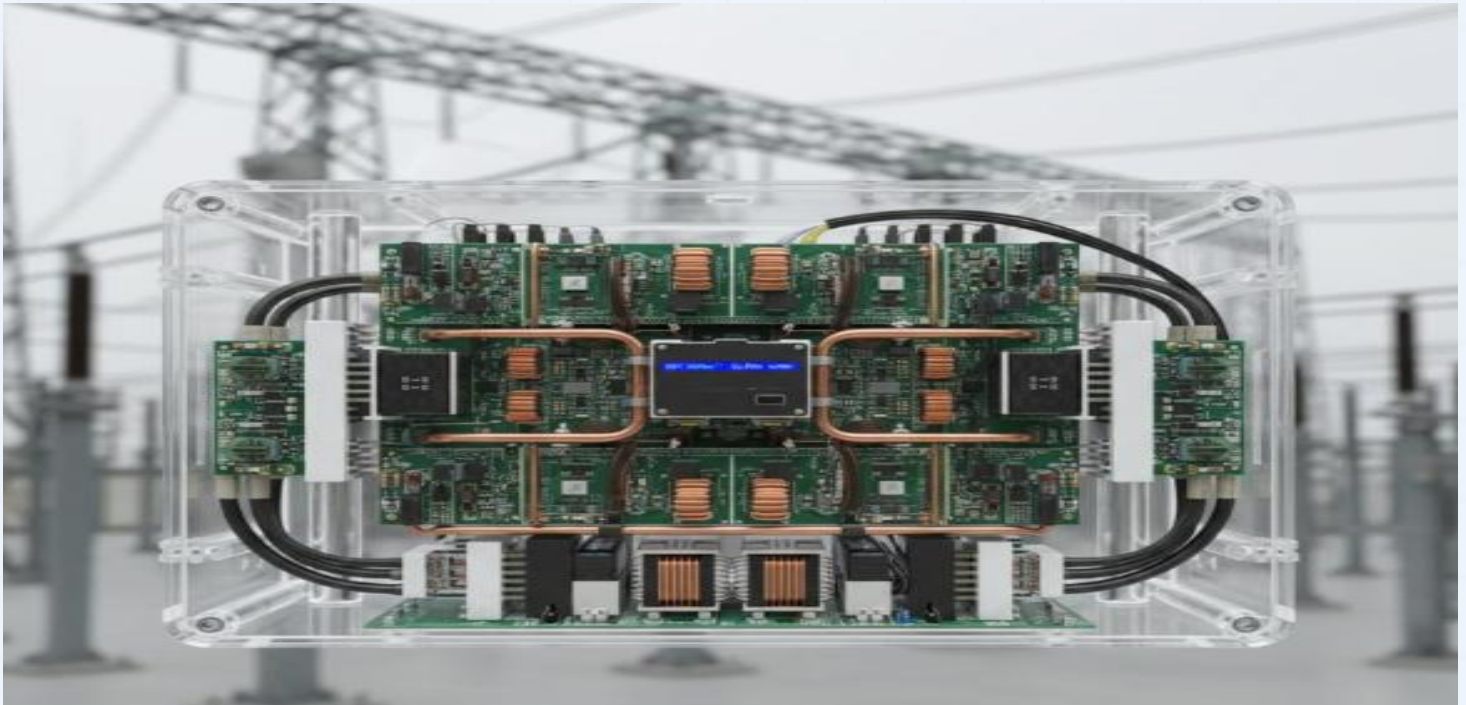
Super
Grids



High-voltage transmission is the process of transferring large amounts of electrical power from generating stations to receiving substations over long distances using high-voltage transmission lines. The voltage generated at the power station is increased using a step-up transformer before transmission. The use of high voltage reduces the current flowing through the conductors, which helps to minimize I^2R power losses and improves the efficiency of the transmission system. High-voltage transmission also reduces the size and cost of conductors required for transmitting a given amount of power. The transmitted voltage is later reduced by step-down transformers at substations before supplying electricity to distribution networks and consumers. Thus, high-voltage transmission plays an important role in the reliable, efficient, and economical delivery of electrical energy.

Solid-State Transformers: The Next Generation of Power

Future Grid
Transformers



^S
^A Solid-State Transformer (SST) is an advanced type of transformer that uses power electronic devices, high-frequency transformers, and control circuits to transfer electrical energy from one voltage level to another. Unlike conventional transformers, which operate mainly using electromagnetic induction at the supply frequency, an SST converts electrical power through several stages of power electronic conversion. The input AC voltage is first converted into DC, then converted into high-frequency AC, passed through a high-frequency transformer for voltage conversion and isolation, and finally converted into the required AC or DC output. Because of its advanced control system, an SST can provide voltage regulation, power-flow control, power-factor correction, and bidirectional power flow. Solid-state transformers have important applications in smart grids, renewable energy systems, electric vehicle charging stations, battery energy storage, railway systems, microgrids, and distributed power generation.

VTU27145 STEEVENSON SOHTUN

Beyond Today: Shaping Tomorrow



The world is changing faster than ever before. Advances in technology, changing lifestyles, environmental challenges, and new ideas are shaping the way we live, work, learn, and communicate. From smartphones and artificial intelligence to electric vehicles and renewable energy, innovations that once seemed impossible are becoming part of everyday life. At the same time, society is becoming more connected, and people are looking for cleaner, safer, and more sustainable ways of living.

Looking toward the future, the world of 2050 may look very different from today. Smart cities could use technology to manage transportation, energy, water, and public services more efficiently. Electric and autonomous vehicles may become more common, while renewable energy could play a larger role in meeting global energy needs. Education and workplaces may become increasingly flexible, with digital technologies allowing people to learn and work from almost anywhere.

However, the future is not only about technology. Climate change, population growth, resource management, employment, privacy, and social equality will also influence the world of tomorrow.

VTU27161

PEDALANKA PHANINDRA

If Trees Could Speak Tomorrow



If trees could talk, they would have countless stories to tell. They would speak of the birds that built nests in their branches, the children who played beneath their shade, the rain that touched their leaves, and the seasons they have witnessed. Trees quietly support life by providing shade, helping regulate water, protecting soil, storing carbon, and offering homes for many species. They might also ask us why we cut down forests without thinking the future. Perhaps their message would be simple: "We give you so much, so please protect us." If we listened carefully, we might realize that trees do not need a human voice to speak. Their leaves, branches, fruits, and roots already tell us how important they are. Protecting trees means protecting the beauty and life of our planet for generations to come.

VTU27154 MALLE SAIKIRAN

Placement: A Beautiful Journey

The placement season is far more than a stepping stone toward a career; it is a transformative rite of passage for every engineering student. What begins with anxious resume drafting, late-night aptitude prep, and endless mock interviews gradually evolves into a deep journey of self-discovery, resilience, and personal growth.

Each recruitment drive brings its own blend of anticipation and learning. Rejections teach humility and perseverance, while small victories rebuild confidence. Through group discussions, technical rounds, and HR interactions, students learn not only how to solve complex engineering problems under pressure, but also how to articulate their passion and unique strengths with clarity.

When that final offer letter arrives, it marks much more than an employment opportunity. It stands as a testament to years of hard work, sacrifices, and shared late-night study sessions with peers. Placements truly embody a beautiful journey—turning student aspirations into real-world impact.

VTU27154 MALLE SAIKIRAN

Rangoli: Dots, Dust, Delight...

Rangolis'



VTU22378 Varshini

Art: Shading Some Real Truth!

Arts''



VTU19723 Adesh

Quiz: Brain On Fire

➤ Which type of electrical instrument can be used for measuring both direct current (DC) and alternating current (AC)?

- A) PMMC instrument B) Moving Iron instrument C) Electrostatic voltmeter D) Galvanometer

Answer: B) Moving Iron instrument

➤ What is connected in parallel with a PMMC ammeter to extend its current measuring range?

- A) Multiplier B) Shunt resistor C) Blocking diode D) Series inductor

Answer: B) Shunt resistor

➤ Which bridge circuit is specifically used for the precise measurement of very low resistances (such as armature windings or cable resistance)?

- A) Wheatstone bridge B) Maxwell's bridge C) Kelvin's double bridge D) Schering bridge

Answer: C) Kelvin's double bridge

➤ What type of instrument is universally used as an AC energy meter (kWh meter) for domestic electrical billing?

- A) PMMC instrument B) Induction type instrument C) Moving iron instrument D) Hot-wire instrument

Answer: B) Induction type instrument

➤ Which instrument transformer is used in conjunction with standard low-range ammeters to measure very high alternating currents safely?

- A) Potential Transformer (PT) B) Current Transformer (CT) C) Auto-transformer D) Isolation transformer

Answer: B) Current Transformer (CT)

TTS 2652 Mr.R.Sreedhar

Quiz: Brain On Fire

➤ I am the large synchronous machine in a power plant that converts mechanical energy into bulk alternating current. What am I?

Answer: Alternator

➤ I am the static electromagnetic device used to step voltage up for long-distance transmission or down for distribution. What am I?

Answer: Transformer

➤ I am the high-voltage facility where electrical power is pooled, managed, and rerouted across different voltage levels. What am I?

Answer: Substation

➤ I am the heavy-duty switch designed to automatically interrupt high fault currents to protect power systems. What am I?

Answer: Circuit-breaker

➤ I am the large-scale interconnected network of power stations, transmission lines, and substations linking generation to consumers. What am I?

Answer: Grid

➤ I am the dielectric device that mechanically supports high-voltage overhead lines while preventing current leakage to supporting towers. What am I?

Answer: Insulator

➤ I am the vital safety mechanism that provides a low-resistance path to the earth for fault currents. What am I?

Answer: Grounding

➤ I am the metallic strand or cable stretched across transmission towers to carry electrical current over long distances. What am I?

Answer: Conductor

TTS 2151 Mr. Barathi. K

◆ CREDITS

Editorial Team & Acknowledgements

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