



Vel Tech
Rangarajan Dr. Sagunthala
R&D Institute of Science and Technology
(Deemed to be University Estd. u/s 3 of UGC Act, 1956)

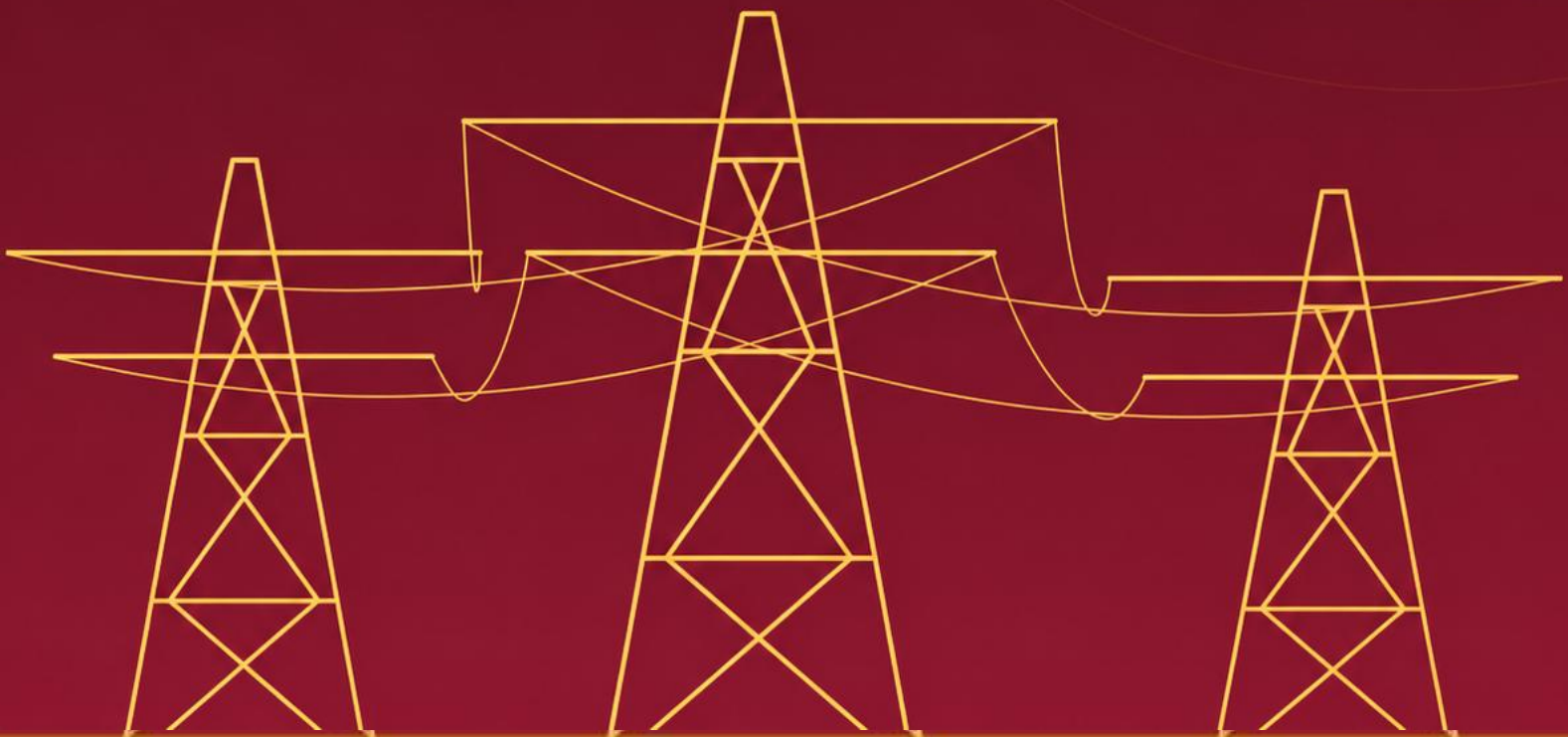
SCHOOL OF ELECTRICAL AND COMMUNICATION

**DEPARTMENT OF
ELECTRICAL AND ELECTRONICS ENGINEERING**

Spark Magazine

(2022 – 23)

ISSUE- 02 (December 2022)



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. V. Jayasankar

Professor & Dean
School Of Electrical and Communication



Driven by our faculty, students, and staff, the School continues to make remarkable progress in cutting-edge research, academic excellence, and industry collaboration. Spark, the EEE department magazine, beautifully highlights this journey—showcasing our commitment to innovation, hands-on learning, and community impact. I commend the team for their dedication to shaping future-ready professionals and bringing these key milestones to light.

Dr. P.Chandrasekar

Professor & Head
Department of Electrical and Electronics Engineering



It is with great pleasure and pride that I present SPARK, the official magazine of the Department of Electrical and Electronics Engineering. I invite you to explore these pages to discover the remarkable achievements and initiatives within our department. Together, we look forward to a bright future defined by groundbreaking research, transformative education, and impactful contributions to the field.

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.

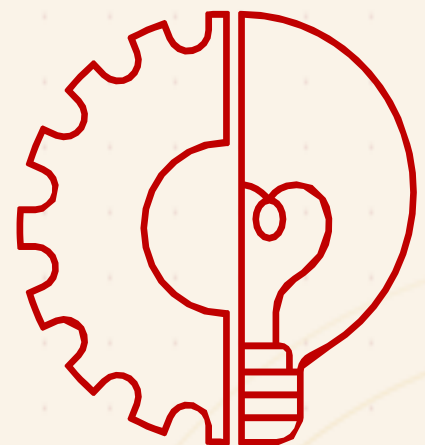


DRIVEN BY INNOVATION

Some people don't like change, but you need to embrace change if the alternative is disaster.

- Elon Musk

At Tesla, Elon Musk promotes a software-first philosophy in vehicle design, much like the topics covered in the lecture. Tesla's innovations such as Autopilot, Full Self-Driving, and over-the-air updates are direct results of robust software lifecycle management. Heavy use of centralized ECUs and in-house software development aligns with the lecture's emphasis on integration and control. Musk's vision pushes continuous innovation, combining software, AI, and electronics—setting the industry standard.



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INDUSTRY 4.0 INSIGHTS

Automation isn't just about machines Working faster, it's about ideas moving smarter.

Industry 4.0 marks a transformative shift in manufacturing and industrial practices by integrating digital technologies such as the Internet of Things (IoT), Artificial Intelligence (AI), Big Data, Cloud Computing, Robotics, and Cyber-Physical Systems. Unlike previous revolutions driven by steam, electricity, or automation, Industry 4.0 is powered by intelligent connectivity and real-time data exchange.

This revolution is enabling smart factories, where machines communicate, adapt, and make decisions with minimal human intervention. From predictive maintenance and digital twins to autonomous logistics and mass customization, Industry 4.0 is redefining productivity, efficiency, and sustainability across sectors. More than a technological upgrade, Industry 4.0 is a mindset shift—pushing industries toward agile, responsive, and data-driven ecosystems. As future engineers, embracing these technologies is not optional but essential, opening doors to innovation and global competitiveness.



VTU20248 K GUHAN

TechPulse

Your voice can spark someone else's vision.

-Nancy Duarte

Embedded Systems in Everyday Devices

Embedded electronics are quietly running our world—from washing machines to drones. Their ability to perform dedicated tasks efficiently makes them essential for automation.

Smart Energy Monitoring Systems

AI-integrated energy management platforms help industries track usage, forecast demand, and reduce wastage. These systems lead the way toward sustainable and cost-effective power consumption.

Robotics in Modern Industry

Industrial robots are no longer just mechanical arms—they now think, sense, and adapt. From precision assembly to hazardous environment tasks, robotics ensures safety, accuracy, and scalability.

Electronics & Robotics – Powering the Future Together Where intelligent circuits meet dynamic machines, innovation thrives. The fusion of electronics and robotics is shaping smart industries, responsive devices, and human-assistive technology.

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WAVE OF EMERGING TECHNOLOGIES

Emerging Technology Trends in Engineering

AI & Machine Learning in Industrial Automation

AI and ML algorithms are transforming industries by enabling smart manufacturing, predictive maintenance, and advanced quality control systems.

5G and Advanced Telecom

Ultra-fast 5G networks are driving innovations in autonomous systems, remote operations, and real-time communication across sectors.

Blockchain Technology

Decentralized systems are redefining finance, supply chain management, and cybersecurity with transparent, tamper-proof solutions.

Internet of Things (IoT)

Connected devices are optimizing processes from smart cities to industrial automation, with a focus on secure, scalable, real-time systems.

Cloud Computing

Cloud platforms are powering flexible work environments, scalable applications, and AI-driven analytics, enabling global collaboration like never before.



VTU 12970 Shiva Prasad



FUTURE OF CORE INDUSTRIES

Automation & Smart Manufacturing

The adoption of AI, robotics, and advanced analytics is revolutionizing manufacturing by boosting efficiency, reducing errors, and enabling real-time decision-making. Smart factories now integrate automated quality control and predictive maintenance, ensuring higher productivity while reducing downtime, making automation a key driver of industrial competitiveness in 2021–2022.



Green & Sustainable Engineering



Sustainability emerged as a top priority, with industries focusing on renewable energy integration, eco-friendly materials, and resource-efficient processes. From smart grids to low-emission manufacturing, the shift toward greener practices is both an environmental responsibility and a market advantage, positioning sustainable engineering as a vital trend for future growth.

Digital Twin Technology

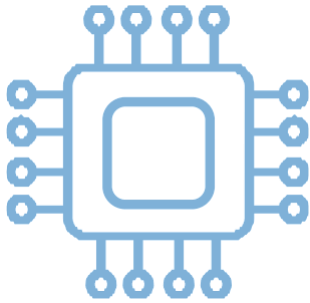
Digital twin systems create real-time virtual replicas of physical assets, enabling performance monitoring, predictive maintenance, and process optimization without disrupting operations. In 2021–2022, industries increasingly adopted this technology to enhance efficiency, reduce costs, and improve design accuracy, bridging the gap between digital simulation and real-world industrial performance.



VTU 12970 Shiva Prasad



BOOST IN AUTOMATION



Predictive Maintenance

Modern PLC systems leverage sensor data and analytics to anticipate equipment issues before they escalate. This approach minimizes downtime, reduces maintenance costs, and increases the overall lifespan of machinery, making predictive maintenance a vital practice in competitive industrial environments.

Custom Industrial Solutions

PLCs allow engineers to design and implement tailored automation solutions that meet specific process requirements. This flexibility supports improved safety, energy efficiency, and productivity, making custom PLC configurations essential for industries aiming to remain agile and responsive to changing production needs.



VTU20248 K GUHAN



A CALL FOR CHANGE

Poverty is not just a lack of money; it is not having the capability to realize one's full potential.

— Amartya Sen

As students, we are constantly growing — not just in knowledge, but in perspective. Every classroom discussion opens our minds to new ideas and challenges. From science labs to seminar halls, we learn to question, explore, and innovate. It's not just about marks or grades — it's about becoming problem-solvers and thinkers.

The world is changing fast, and we are learning to adapt, lead, and contribute with confidence. Our teachers and mentors play a vital role in shaping this journey with guidance and encouragement. Through every experience, we're preparing to create a future that's brighter, better, and more meaningful, built on values, creativity, and collaboration.

With every step, we grow stronger, building resilience, nurturing curiosity, and developing the courage to turn challenges into opportunities. Together, we are not only learning for ourselves but also preparing to inspire, support, and make a lasting difference in the world around us.

VTU 12970 Shiva Prasad



Art: Shading Some Real Truth!



VTU18180 Jashuva

SUDOKU: Fun and Learn...



SUDOKU



			4		8			
	6			7			1	
7		2		9		5		4
	9		7		4		3	
		7		5		8		
	8		9		6		5	
9		4		1		7		8
	7			6			4	
			2		7			



Answer Key

8	1	5	2	4	7	9	3	6
3	7	9	6	8	5	1	2	4
4	2	6	9	1	3	8	7	5
5	4	7	1	3	8	6	9	2
2	3	8	5	7	9	4	1	6
6	9	4	2	6	1	3	8	7
7	5	3	8	9	2	1	6	4
1	6	8	7	2	4	5	9	3
9	8	1	3	4	6	2	5	7

VTU18180 Jashuva

Riddle: Electrical Engineering

- I am born when a conductor moves through a changing magnetic field, yet I push back against the very change that created me. What am I?

Answer: Back EMF (or Lenz's Law / Induced Voltage)

- I am invisible and weightless, but I flow through metal pathways to light up cities. Step on my path carelessly and I can shock you, but control me well and I run the world. What am I?

Answer: Electrical Current (or Electricity)

- I store energy not by holding chemicals, but by creating an electric field between two isolated plates. I block Direct Current completely, yet I let Alternating Current pass right through. What am I?

Answer: Capacitor

- I have no moving parts, yet I can step up or step down the energy of an entire region. I work through invisible mutual magnetic bonds, but if you feed me DC, I stay completely still. What am I?

Answer: Transformer

- I am a silent guardian standing along the power lines. When lighting strikes or voltage surges, I divert the danger safely into the ground without dropping a beat. What am I?

Answer: Surge Arrester (or Lightning Arrester)

- I am the semiconductor switch that unlocked the modern power world—combining the easy voltage control of a MOSFET with the high-current stamina of a bipolar transistor. What am I?

Answer: IGBT (Insulated-Gate Bipolar Transistor)

TTS 2652 Mr.R.Sreedhar

Quiz Challenge: Electrical Engineering

• The SI unit of electrical resistance, named after the German physicist Georg Ohm, is the _____.

Answer: Ohm (Ω)

• According to Ohm's Law, the voltage across a conductor is directly proportional to the product of current and _____.

Answer: Resistance

• A transformer operates fundamentally on the principle of electromagnetic _____ induction.

Answer: Mutual

• The large-scale interconnected network that links power generation stations to consumers across regions is known as the _____.

Answer: Grid (or *Power Grid*)

• A power electronic converter circuit that transforms Direct Current (DC) into Alternating Current (AC) is called an _____.

Answer: Inverter

• An electrical instrument used to measure the rate of flow of electric current in a circuit is called an _____.

Answer: Ammeter

• The passive electronic component designed to temporarily store electrical energy within an electrostatic field is the _____.

Answer: Capacitor

• The type of electric motor widely used in modern electric vehicles due to its high efficiency, reliability, and power density is the Permanent Magnet _____ Motor (PMSM).

Answer: Synchronous

TTS 1495 Mr.P.Sivaraj

◆ CREDITS

Editorial Team & Acknowledgements**ACKNOWLEDGEMENTS**

The editorial team thanks the management of Vel Tech Rangarajan Dr.Sagunthala R&D Institute of Science and Technology for their constant encouragement, the Head of the Department for guidance, the faculty members who contributed articles, and student's who shared their contents

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PROOF READING

Mr. R. Sreedhar
Assistant Professor,
EEE