POWER VISION

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

MAGAZINE

Powering Tomorrow's Tech Frontier Innovatively.

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Kongunadu College of Engineering and Technology
(Autonomous)
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Preface

Welcome to Power Vision - Your Gateway to the Dynamic World of Power Engineering! In this premier edition, we invite you to embark on a captivating journey through the electrifying landscapes of innovation, sustainability, and excellence within the realm of power engineering.

Power Vision is not just a magazine; it's a testament to the transformative power of electricity in shaping our world. From cutting-edge technologies to visionary projects, each page is meticulously crafted to inspire and inform, showcasing the latest advancements and trends in the field.

Join us as we explore the forefront of power engineering, uncovering the groundbreaking research, impactful initiatives, and remarkable achievements that are driving progress and shaping the future of energy. Whether you're a seasoned professional, an aspiring engineer, or simply a curious mind eager to learn, Power Vision promises to enlighten and empower.

So, immerse yourself in the illuminating world of power engineering with Power Vision as your guide. Let us ignite your curiosity, spark your imagination, and empower you to make a difference in the electrifying journey ahead. Welcome to Power Vision - where the future of power awaits!

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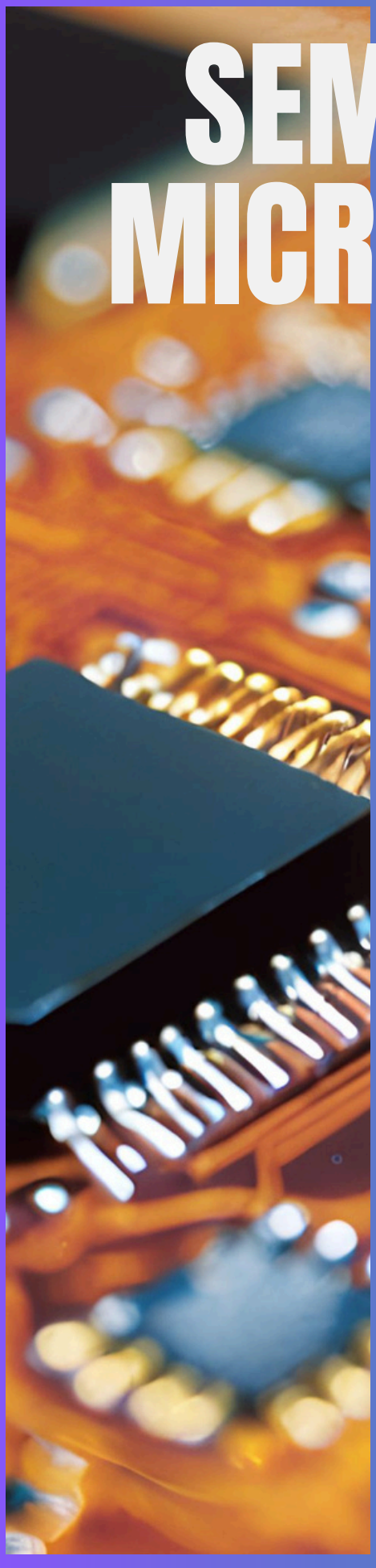


SEMICONDUCTOR MICROELECTRONICS

Microelectronics and semiconductors are crucial to modern technology, underpinning everything from smartphones and laptops to medical devices and automotive systems. Microelectronics involve the design and fabrication of miniaturized electronic devices, including Integrated Circuits (ICs) and Light Emitting Diodes (LEDs), while semiconductors, like silicon, germanium, and gallium arsenide, are materials that conduct electricity under specific conditions.y The industry faces a severe global shortage, impacting multiple sectors and causing delays across supply chains. This shortage has led to increased prices, reduced production, and disruptions in industries, including defense and consumer electronics.Efforts to address these issues include government initiatives such as President Biden's executive order to boost domestic chip production and substantial funding for semiconductor research and development. Economic strategies focus on enhancing R&D investments and promoting STEM education to cultivate a skilled workforce.Emerging trends, such as advancements in AI and new semiconductor materials, promise future innovation. As technology evolves, microelectronics will remain central to advancing electronic systems and overcoming current challenges

M. Swathi

III YEAR

nstxl.org/talking-about-microelectronics-and-semiconductors

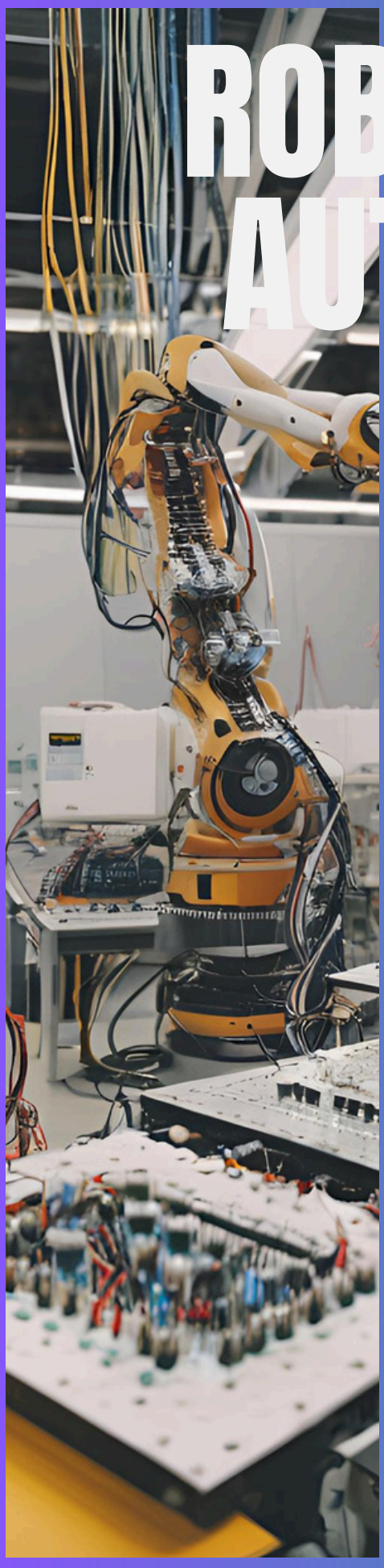
WEARABLE TECHNOLOGY

Wearable electronics seamlessly integrate computing devices into everyday items like watches, glasses, and clothing. This sector has experienced explosive growth, driven by advancements in technology over the past decade. While wearable tech offers impressive benefits—such as real-time health monitoring and constant connectivity—several challenges persist.

Key concerns include social acceptability, potential security risks, and information overload. For instance, the integration of technology into fashion poses questions about social norms and privacy. Additionally, the constant data collection can lead to security vulnerabilities and excessive information. As wearable devices capture sensitive personal data, safeguarding against breaches becomes crucial. Moreover, issues related to battery life and device durability remain ongoing challenges. Despite these hurdles, the future of wearable electronics remains promising. Innovations in sensors and miniaturization are poised to enhance various fields, from healthcare to fitness. The market is projected to reach $70 billion by 2025, reflecting the ongoing impact of wearable technology on our daily lives and its potential to redefine how we interact with technology. As these devices evolve, they may become integral to modern living, shaping the future of personal and professional technology.

C. Keerthana shivani
III YEAR

sites.tufts.edu/eeseniordesignhandbook/2015/wearable-electronics



ROBOTICS AND AUTOMATION

As we enter 2024, the fields of robotics and automation present exceptional career opportunities for electrical engineers. Rapid advancements in technology and increasing industry adoption are driving demand for experts who can design, develop, and maintain cutting-edge automated systems. This sector is revolutionizing industries such as manufacturing, healthcare, and agriculture, leading to roles like Robotics Software Engineer, Automation Controls Engineer, and Robotics Systems Integrator. These positions offer the chance to work on innovative projects involving AI, autonomous systems, and cybersecurity, offering diverse career paths and lucrative prospects.

Key trends include the integration of artificial intelligence, heightened focus on cybersecurity, and a shift towards sustainable and energy-efficient technologies. Engineers can stay ahead by pursuing advanced degrees, obtaining relevant certifications, and continuously updating their skills. The rise of smart infrastructure and the Industrial Internet of Things (IIoT) further amplifies career opportunities. The year 2024 is a prime opportunity for electrical engineers to engage in transformative projects, ensuring a rewarding and impactful career while shaping the future of technology.

S. Dharshini
IV YEAR

vlsifirst.com/blog/electrical-engineers-in-robotics-automation

THE 1880S SAW THE INVENTION OF ELECTRIC CARS

Between 1882 and 1839, Robert Anderson invented the first successful electric carriage, a motorized vehicle that used galvanic battery cells.

Another inventor, Robert Davidson of Aberdeen, created an electric locomotive prototype in 1837. Later, in 1841, he built a better and bigger version that could travel 1.5 miles at 4 mph, towing six tons.

In England, Thomas Parker built electric trams and prototypes of electric vehicles in 1859. Also, American inventor William Morrison invented the first electric carriage in the US in 1887, which appeared in a city parade in 1888, powered by 24 batteries. These inventors created a wave of electric cars, later replaced by fossil fuel-powered alternatives that were more efficient and cheaper to run. However, their work began the journey toward today's EVs.

S. Vignesh
IV YEAR

https://www.trvst.world/renewable-energy/electricity-facts/

THE BRAIN CAN POWER A LIGHT BULB

Nerve cells communicate by tiny pulses of electricity, which are triggered by changes in the membranes of nerve cells that allow charged molecules to flow in and out of the cell in response to chemical signals. In other words, the brain generates its own electricity.

This is why an electric shock feels so strange and can cause the body to jerk uncontrollably, as the outside electricity makes the nervous system's electrical machinery go haywire.

Together, the power generated by all 86 billion neurons in the brain would be enough to power a low-wattage light bulb.

A. Sam

II YEAR

https://www.livescience.com/facts-about-electricity

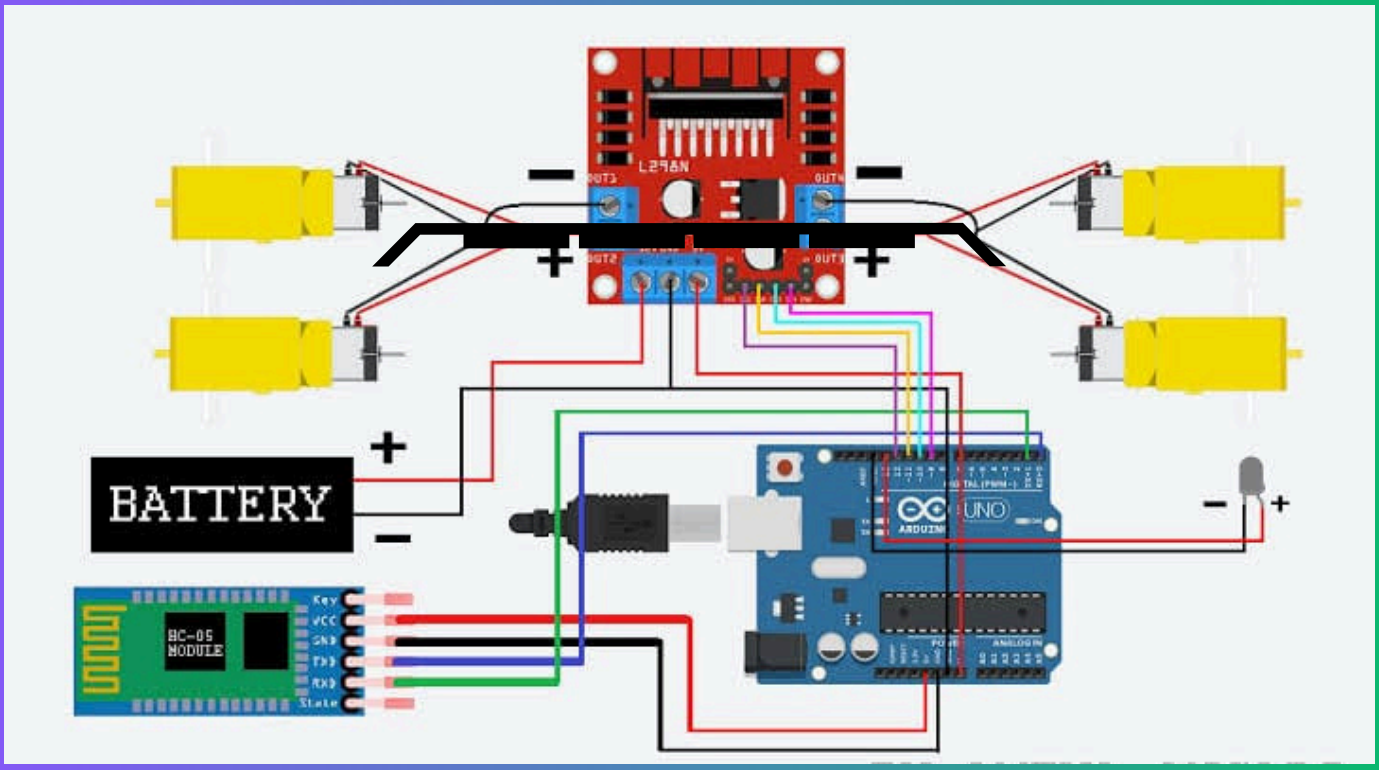
DIY "BUILD YOUR OWN BLUETOOTH-CONTROLLED CAR WITH ARDUINO: A STEP-BY-STEP GUIDE"

Creating a Bluetooth-controlled car using Arduino allows you to drive your car wirelessly. Follow these steps to build your own.

HARDWARE COMPONENTS

- Arduino Board
- Bluetooth Module
- Humidity sensor
- Connecting wires
- DC motor
- Power supply

STEP 1: CIRCUIT DIAGRAM



Motor Driver Connection:

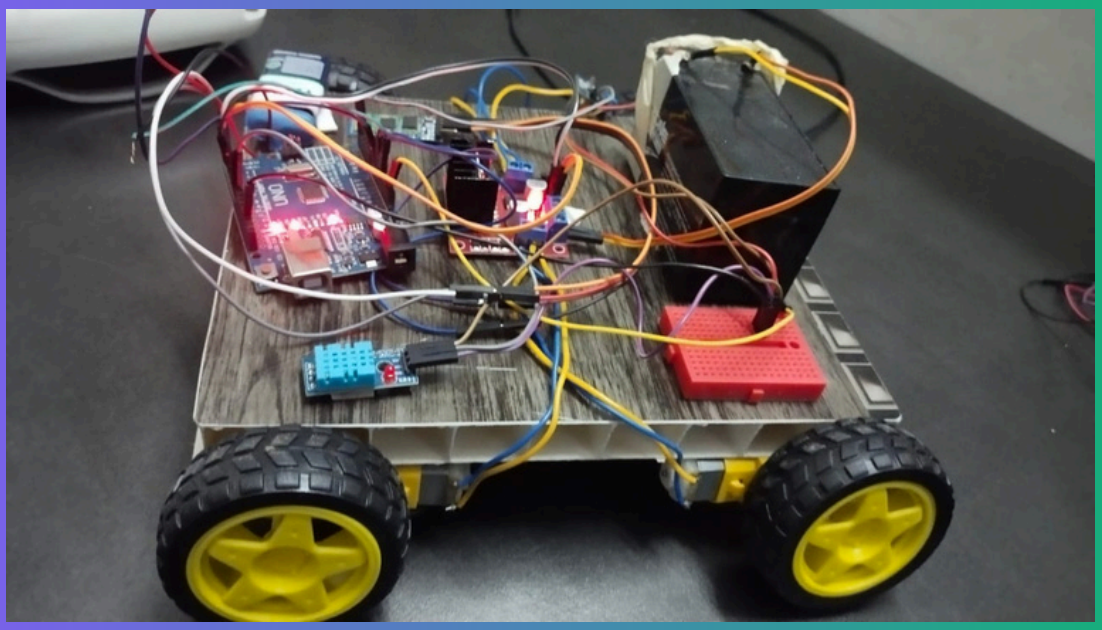
- IN1, IN2 to Arduino pins 8, 9.
- IN3, IN4 to Arduino pins 10, 11.
- Motor outputs to motors.
- Power supply to motor driver and motors.
- Common ground between Arduino and motor driver.

Bluetooth Module (HC-05) Connection:

- VCC to 5V on Arduino.
- GND to GND.
- TX to Arduino RX.
- RX to Arduino TX.

STEP 2: HOW IT'S WORKS

The Bluetooth-controlled car uses an Arduino to interpret commands from a Bluetooth module and control the movement of the car through a motor driver. When you send a command, such as forward, backward, left, or right, the Bluetooth module transmits the signal to the Arduino. The Arduino then processes this signal and activates the motor driver to adjust the direction and speed of the DC motors, enabling precise control of the car's movements.



For larger or more advanced setups, the core concept remains the same, but you may need to scale up the components. This involves using more robust motor drivers, a higher-capacity power supply, or additional sensors. Adjustments to the hardware and Arduino code are necessary to accommodate these changes, ensuring that the system operates efficiently and reliably in more complex or larger configurations.

-M Srikanth , P Dinesh Murugan & J Valan Joshi (III year)

Drivers ready to embrace wireless EV technology

source: University of Auckland

Drivers are optimistic about 'on road' dynamic wireless charging that allows EV users to charge their batteries while driving -- but there are concerns

A survey of 1150 existing and prospective EV drivers in New Zealand shows that dynamic wireless charging technology is viewed positively overall, despite some concerns about safety and cost. Conducted by University of Auckland researchers Ramesh Majhi, Prakash Ranjitkar, Selena Sheng, the study reveals that 93 percent of respondents are optimistic about this technology and interested in trying it.

The convenience and ease of use are the main advantages, with urban users and those prioritizing sustainability being more likely to support it. Social influences also affect the willingness to adopt the technology. However, concerns include data privacy, electromagnetic radiation, and potential costs. While practical challenges exist for urban use, dynamic wireless charging could greatly benefit intercity travel by reducing reliance on plug-in stations.

Could high-temperature single crystals enable electric vehicles capable of traveling up to one million kilometers?

Source: Pohang University of Science & Technology (POSTECH)

Researchers are advancing the durability of nickel-based cathode materials crucial for lithium-ion batteries in electric vehicles (EVs). Traditional nickel cathodes, composed of polycrystalline structures, often degrade during charge-discharge cycles, shortening battery lifespan. To address this, scientists are focusing on synthesizing these materials into single crystals at specific high temperatures. Above a critical threshold, a process known as densification occurs, increasing grain size and reducing internal voids. This results in exceptionally durable single crystals that resist degradation over extended use, promising longer-lasting batteries for EVs.

Professor Kyu-Young Park from POSTECH emphasizes their novel synthesis strategy as pivotal for enhancing battery durability. This research not only aims to extend battery lifespan but also to make EVs more cost-effective and efficient. By optimizing battery performance through advanced material design, researchers are driving forward sustainable electric vehicle technologies.

In summary, the development of high-quality single-crystal nickel cathode materials represents a significant breakthrough in battery technology. It underscores ongoing efforts to innovate and improve lithium-ion batteries' performance, reliability, and lifespan, critical for accelerating the adoption of electric mobility worldwide.

www.sciencedaily.com/releases/2024/07/240710130555.htm

THE FUTURE OF ELECTRICAL AND ELECTRONICS TECHNOLOGY: INNOVATIONS AND APPLICATIONS

THE REALM OF ELECTRICAL AND ELECTRONICS TECHNOLOGY IS UNDERGOING RAPID TRANSFORMATIONS, DRIVEN BY ADVANCEMENTS IN MATERIALS SCIENCE, COMPUTING, AND COMMUNICATIONS. THIS ESSAY EXPLORES THE LATEST INNOVATIONS AND APPLICATIONS SHAPING THIS DYNAMIC FIELD, FOCUSING ON RENEWABLE ENERGY AND ARTIFICIAL INTELLIGENCE (AI).

RENEWABLE ENERGY TECHNOLOGIES

A significant trend in electrical technology is the shift towards renewable energy sources. Solar and wind power are at the forefront, with advancements making these energy sources more efficient and cost-effective.

WIND ENERGY ADVANCES

In wind energy, the development of larger and more efficient turbines has significantly increased the capacity of wind farms. Offshore wind farms, in particular, are benefiting from floating wind turbine technology, allowing for installations in deeper waters with stronger and more consistent winds. This innovation is expected to boost global wind energy capacity substantially.

ARTIFICIAL INTELLIGENCE (AI)

Predictive Maintenance

In industrial settings, AI-powered predictive maintenance systems analyze data from sensors embedded in machinery to predict failures before they occur. This approach minimizes downtime and extends the lifespan of equipment, leading to significant cost savings.

Energy Management

AI algorithms are being used to optimize energy consumption in buildings and industrial processes. By analyzing patterns in energy use, these systems can make real-time adjustments to improve efficiency. For example, AI can manage heating, ventilation, and air conditioning (HVAC) systems more effectively, ensuring comfort while reducing energy consumption.

Autonomous Systems

The development of autonomous vehicles and drones is another area where AI and electronics intersect. These systems rely on advanced sensors and AI to navigate and perform tasks without human intervention. Applications range from self-driving cars improving road safety and reducing traffic congestion to drones enhancing logistics and delivery services.

CONCLUSION

The future of electrical and electronics technology is bright, with numerous innovations poised to reshape industries and improve our daily lives. From the widespread adoption of renewable energy sources to the integration of AI, these advancements are driving greater efficiency, sustainability, and convenience. As research and development continue to push the boundaries of what is possible, the impact of these technologies will only grow, creating a more connected and intelligent world.

S.Kaviya
III YEAR

SOULFUL LINES

"இனி ஏதேனும்"

இனி ஏதேனும் தேவை
இல்லையே,
அலசல் உரிமை தந்திடாதே!
என்றே குறைவாகக் கூறுகிறேன்,
என்று சொல்லாதே, உன்னிடம்!
நம் தாயகம் நிலைத்து நிற்க,
நல் செயல் ஒவ்வொரு நாளும்,
அனைவரும் வலிமையாகச்
செயல்,
அமைதி பணி, கண்டு கொள்!
இனி ஏதேனும் தேவை
இல்லையே,
என்றும் புலிகள் தோய்ந்தும்,
பூரணமே நடக்கச் செய்ய,
அறக்கட்டளை செய்வதே!
விழுந்து களை கெடுக்க விடு,
என்னைத் தவிர, விடாய்,
மாறாமல் நம் பணி முடிக்க,
மதி உறுதி சொல்லவேண்டும்.

B. Balaji
IV YEAR

எதிர்கால நிலைமை

வடஇந்தியா தொழில் கொழித்த
பகுதி ஆகவும், திராவிட நிலப்பகுதி
பாழ்படுகின்ற இடமாகவும்,
தாய்மொழியின் எதிர்காலம்
பாழ்படவும், இந்திமொழியின்
ஆதிக்கம் ஏற்படவும், விலைகள்
விஷமாதிக்கப் போல உயரவும்,
வேலையில்லாத திண்டாட்டம்
பெருகவும், இயற்கை வளங்கள்
பாழ்படவும், மக்களைத் தாக்கவும்,
உழவுத் தொழில்கள்
உருக்குலையவும், ஏழை
எளியோரை வரிச்சுமை தாக்கவும்,
ஊழல்கள் பெருகவும், உலுத்தர்கள்
கொல்லவும், சமதர்மம் பாழ்படவும்,
சுரண்டல்காரர்களின் கரம்
ஓங்கவும், அடக்கு முறைகள்
தலைவிரித்தாடவும்...!

V. Dhayalan
III YEAR

SOULFUL LINES

“அன்பின் நிலா”

என் உள்ளம் பேசும் நிலவுக்கு,
அந்தச் சொற்கள் வெறும்
கவிதைகள்,
நான் உன்னை ஒற்றுமை தரும்
அழகாகக் காண்கிறேன்,
நீ அப்படி இல்லையா என்றால்
நம்பமுடியுமா?
நிலவின் குரல் அதிர்வெளியில்,
மரணத்தை அட்டகாசமாகக்
கொள்கிறது,
எனது கண்ணீரால்
நீர்த்தோவினை,
எனது அன்பாக
மொழிபெயர்த்துவிடு.
அந்தக் கடல் நமக்கு
பகிர்ந்துகொடுத்த,
அமுதம் அன்றாட வாழ்வின்
கருவியாகவே,
நீ என்னை மயக்கும் நிலா,
பொதுவாக அன்பிற்கான
கண்கருவியாக!

M. Yuvan Adithiya
III YEAR

"சிறிய சொற்கள்"

படலின் கீழ் நதிக்கல்,
கண்ணீரின் மிளிர் வீச,
மரத்தின் கீழ் நிழல்,
என்னை நம்பும் குறள்.
மழையின் சோகம் எட்ட,
பகல் மனம் நிமிர்ந்தது,
முகில் மேல் பூவழி,
சின்ன கனவு வீசுது.

P. Pavithra
IV YEAR

ELEGANT STROKES

Kishore
IV YEAR

KokilaVani
II YEAR

Dhanasekar
III YEAR

ELEGANT STROKES

Kishaa

II YEAR

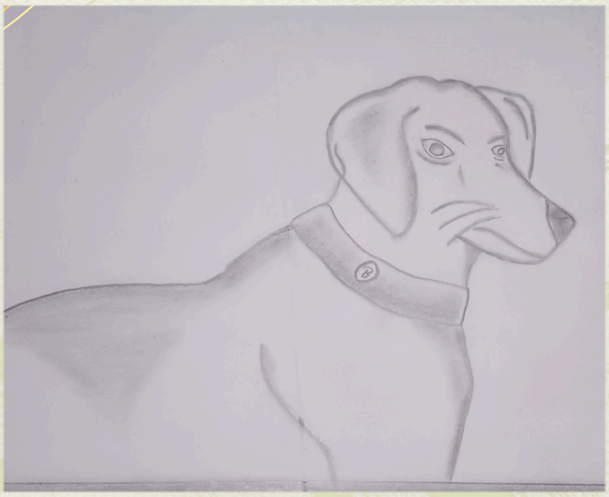
Kishaa

II YEAR

Sugitha

IV YEAR

ELEGANT STROKES

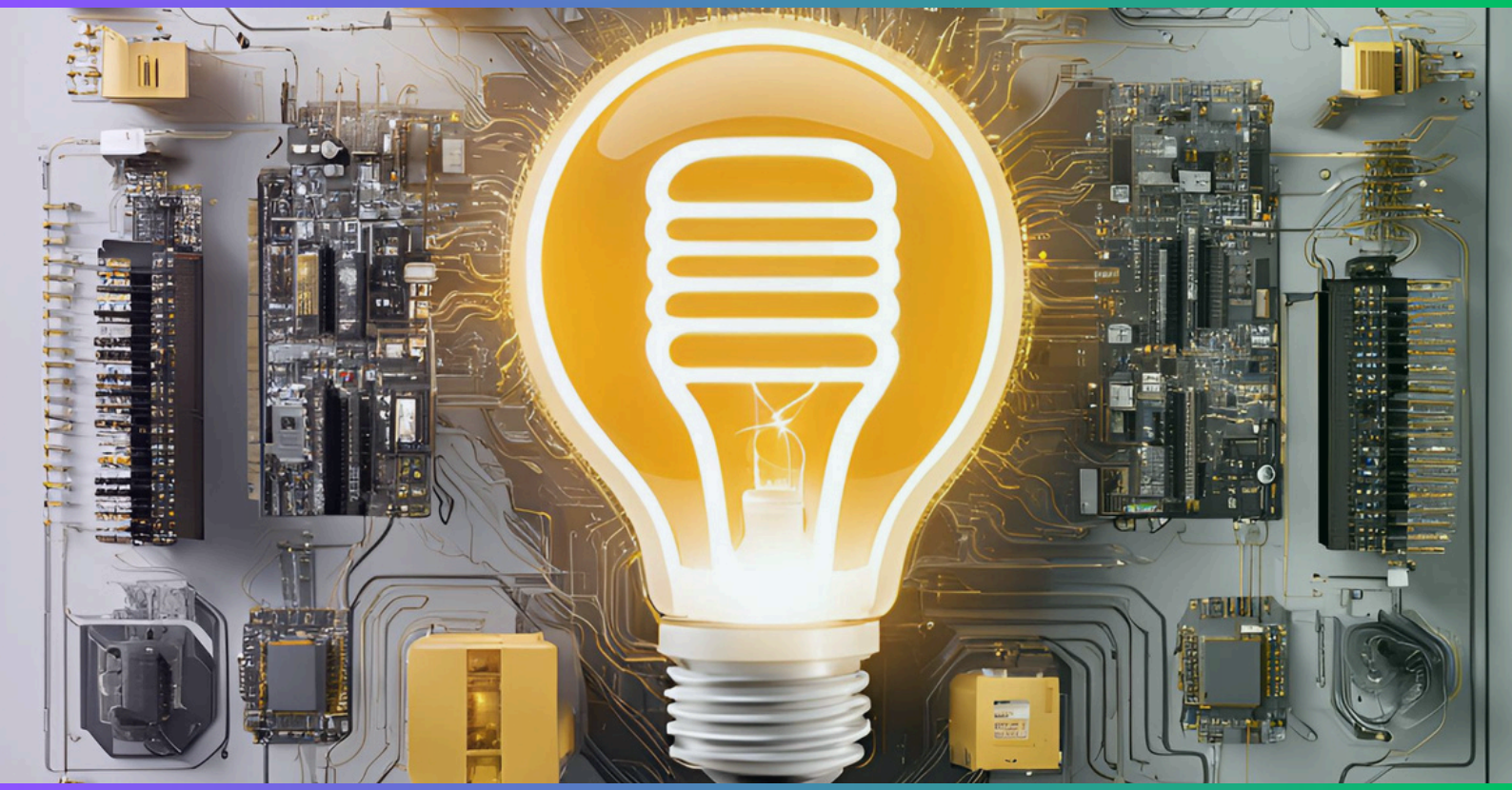


Arun
III YEAR

Srikannth
III YEAR

Hemachandran
III YEAR

EDITORIAL



OUR TEAM

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Dr.R.Shankar, HOD, EEE

EXECUTIVE EDITOR:
Mrs.S.Revathi, AP, EEE

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A Kirubananthan	IV Year
P Dinesh Murugan	III Year
M Srikanth	III Year
M Harish	II Year
S Pooja	II Year

College Vision & Mission

VISION

"To become an Internationally Renowned Institution in Technical Education, Research, and Development by Transforming the Students into Competent Professionals with Leadership Skills and Ethical Values."

MISSION

- **Providing the Best Resources and Infrastructure.**
- **Creating a Learner-Centric Environment and Continuous -Learning.**
- **Promoting Effective Links with Intellectuals and Industries.**
- **Enriching Employability and Entrepreneurial Skills.**
- **Adapting to Changes for Sustainable Development.**

Department Vision & Mission

VISION

"To be a pioneer in Electrical and Electronics Engineering and to create electrical engineering experts with social responsibilities, for global industry needs."

MISSION

- **To facilitate the student's continuous learning with the best infrastructure and environment.**
- **To provide the students with skills, knowledge, and opportunities to function as members of multi-disciplinary teams.**
- **To Empower the students towards popular needs of industry, research, and development**
- **To enable ethics, values and contribution to the society**

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