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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

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## S V COLLEGE OF ENGINEERING

CONTENTS





## Vision of the Department

To prepare the learners globally competent, dynamic and multitalented young leaders with skill set & knowledge in Electrical and Electronics Engineering field with a focus on higher education, professional practice, research and technical consultancy competence ethical con- cern.

## Mission of the Department

- To prepare the learners professionally deft and intellectually adept in the field of Electrical and Electronics Engineering with an excellent infrastructure, core values and qualified & experienced teaching faculty.
- To inculcate skill, knowledge and behavior to cater the dynamic requirements in the field of Electrical and Electronics Engineering.
- To motivate and prepare the learners for career guidance, placements and higher education with a focus on MoUs with premier institutes and industries.

## About the Department

The Electrical & Electronics Engineering department was started with UG programme in 2007 with an intake of 60. The department has well talented, qualified, experienced & dynam- ic faculty along with skilled technical supporting staff who spearhead the process of achieving the vision of the department. The department has well equipped labs & infrastructure. It is continuously striving to impart quality education and competitive spirit among students for academic excellence.

## Strengths of the Department

1. In every semester Department of EEE conducts minimum of two workshops and three guest lecturers in the recent trends in Electrical Engineering to bridge the gap between Aca- demics & Industries, and the students will be guided to do their Major & Minor projects on the same topics.
2. Every faculty member of the department attends a minimum of one faculty development program in every academic year. And most of the faculty members register for NPTEL online courses.
3. Department publishes a newsletter in every six months, which includes the activities that were done in the past two months; fortnight wall magazines based on recent advancements in the field of electrical engineering prepared by students

## Message from Principal

I am delighted to convey my best wishes to the Department of Electrical and Electronics Engineering on the release of its technical magazine. This initiative is a commendable platform that encourages students and faculty to express their ideas, research, and innovations in the ever-evolving field of electrical and electronics engineering.
The EEE department has consistently demonstrated excellence in academics, research, and co-curricular activities. This magazine is a testament to the department's commitment to nurturing creativity, technical knowledge, and analytical thinking among students. It reflects the hard work, vision, and dedication of the entire team.
I congratulate the editorial board, faculty, and all the contributors for their efforts in making this publication a success. I am confident that this magazine will not only inform and inspire but also motivate readers to push the boundaries of learning and innovation.
Wishing the EEE department continued growth, success, and recognition in all its future endeavours.

With warm regards,

**Dr. N. Sudhakar Reddy, Principal**

## Message from HOD

It brings me great joy to see your enthusiasm and talent reflected in the pages of this technical magazine. As your Head of Department, I take pride in watching you grow—not just as engineers, but as thinkers, innovators, and problem-solvers.
This magazine is a true representation of your dedication to learning beyond textbooks. The articles, projects, and ideas showcased here prove that the future of engineering is in capable hands.
Always remember: learning is a lifelong journey. Keep asking questions, keep building, and never be afraid to fail-that's where true innovation begins.
I congratulate all contributors, the editorial team, and the faculty mentors. Keep up the great work!

Happy Reading.

**Dr. V. Lakshmi Devi, HOD, Dept. of EEE**

## Message from Faculty Advisor

It gives us great pleasure to bring the technical magazine Blaze, the department magazine of EEE. The name and fame of an institute depends on the caliber and achievements of the students and teachers. The role of a teacher is to be a facilitator in nurturing the skills and talents of students. We would like to place on record our gratitude and heartfelt thanks to all those who have contributed to make this effort a success. We truly hope that the pages that follow will make an interesting read.

**Dr. J. A. Baskar, EEE**

## ARTIFICIAL LEAVES THAT GENERATE CLEAN ENERGY

Inspired by photosynthesis, researchers have created **artificial leaves** that use sunlight to convert water and carbon dioxide into **hydrogen fuel**. These ultra-thin, flexible leaves float on water and mimic natural leaf structures to harvest solar energy. Ideal for remote or off-grid areas, they offer a portable and sustainable way to produce energy with zero emissions.

Scientists have developed artificial leaves that mimic photosynthesis to produce clean energy. These synthetic leaves use sunlight to convert carbon dioxide and water into hydrogen fuel, which can be stored and used later. The leaves consist of lightweight materials like perovskite and cobalt catalysts that float on water and absorb solar energy with high efficiency.

Researchers believe this technology could be deployed in lakes and ponds, especially in rural areas where conventional solar panels are impractical. One square meter of these leaves can generate up to 250 milliliters of hydrogen per hour, which could be stored in fuel cells to power electronics or even homes in the future.

-E. PADMA PRIYA (22BFA02034)

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## TIDAL POWER PLANTS: HARNESSING THE OCEAN'S MOVEMENT

Tidal energy plants work by placing turbines underwater where rising and falling tides generate rotational energy. Unlike solar or wind, **tidal energy is predictable** and consistent. New floating turbine designs allow for flexible deployment in rivers and estuaries, potentially transforming coastal regions into **clean power hubs**. lights.

Tidal energy systems capture the kinetic energy of ocean tides and convert it into electricity using underwater turbines. Unlike solar or wind energy, tidal power is highly predictable, making it ideal for stable electricity supply. New designs involve floating tidal platforms that anchor to the sea floor, allowing easier installation and maintenance. For example, the MeyGen project in Scotland is one of the world's largest tidal energy facilities and produces up to 398 megawatts of clean energy. These systems can function in estuaries and coastal areas and have minimal impact on marine life when equipped with slow-moving, fish- friendly turbines.

- SREEJA (22BFA02059)

## SOLAR-POWERED ELECTRIC VEHICLES:

Startups are developing electric cars with **solar panels integrated into their body**. These vehicles can charge while parked or driving in daylight, extending range and reducing dependency on charging stations. Models like Aptera and Lightyear One can travel over 700 km on a single charge thanks to solar boosts.

Automakers and startups are developing electric vehicles (EVs) with integrated solar panels to extend range and reduce dependency on charging stations. Cars like the Lightyear 0 and Aptera utilize lightweight materials and aerodynamic designs to maximize solar intake. On a sunny day, these vehicles can gain up to 70 km of additional range, enough for daily city driving without plugging in. Solar panels are usually embedded in the roof, hood, and trunk. Combined with regenerative braking and advanced battery systems, these vehicles represent a significant step toward net-zero transportation.


## BUILDINGS WITH ENERGY-STORING WALLS

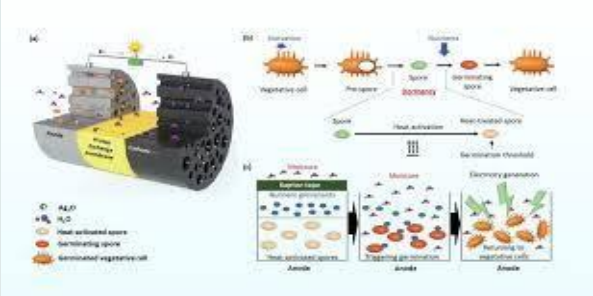
Scientists are creating **bricks and concrete blocks** that double as **batteries**. These materials use carbon nanofibers and special gels to store electricity generated from solar panels on rooftops. Such **energy-storing walls** can power lighting and small appliances, turning buildings into standalone energy systems.


Engineers have created bricks and concrete panels capable of storing and discharging electricity. These smart building materials incorporate carbon nanotubes or conductive polymers, enabling them to function like supercapacitors. A house built with such materials could store energy generated from rooftop solar panels and use it during peak hours. This integration reduces the need for bulky batteries and enhances energy independence. The technology is still in the experimental phase, but pilot projects have shown that one standard wall can power LED lighting for up to 6 hours.

- P. MAHESH BABU (22BFA02071)

## MICROBIOLOGICA BATTERIES USING BACTERIA

Bioengineers have found that certain bacteria can generate electricity as they digest waste. These **microbial fuel cells** can be used in water treatment plants to clean water and generate electricity simultaneously. It's a sustainable way to produce energy while solving waste management issues.



Microbial fuel cells (MFCs) generate electricity using bacteria that feed on organic matter. These systems are particularly promising for wastewater treatment plants, where the microbes break down sewage while producing energy. MFCs can also be used in small-scale remote sensors and marine buoys. The bacteria transfer electrons to electrodes during digestion, creating a flow of current. While the power output is currently low, ongoing research aims to improve efficiency and scalability. In these systems, bacteria break down organic matter—such as wastewater, food waste, or agricultural byproducts—and release electrons as a part of their respiration process. These electrons are captured at the anode, flow through an external circuit, and reach the cathode, thus producing an electric current. The bacteria essentially act as tiny bio-generators.

-M. MANEESHA (22BFA02067)