



VELAMMAL INSTITUTE OF TECHNOLOGY

Chennai - Kolkata Highway, Panchetti, Ponneri - 601 204



DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

ELECTRA 25

(A Technical Magazine)

Academic Year 2024-2025



Institute Vision

To be a leader in imparting quality technical education, research & enterprising skills in pursuit of professional excellence.

Institute Mission

- To promote quality education & technical skills to meet the industry requirements.
- To incorporate team work, leadership skills & lifelong learning.
- To facilitate career development & higher education assistance.
- To encourage innovative ideas for research & development and entrepreneurship for societal needs.
- To inculcate ethical responsibility & human values.

Vision of the Department

To produce highly competent Electrical Engineers and Researchers to fulfil the technological needs of society through innovation and product development.

Mission of Department

- To educate graduates with fundamental principles to acquire advanced technical knowledge in domains of Electrical and Electronics Engineering.
- To provide a progressive environment for innovative creations and rigorous practical training through creative activities in conventional and thrust areas of Electrical and Electronics Engineering.
- To inculcate Societal and Ethical values among the faculties and students.

Program Outcomes (POs)

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering

Program Outcomes (POs)

7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11. **Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage independent and life-long learning in the broadest context of technological change.

Program Educational Objectives (PEOs)

PEO – 1 : Graduates of the program will have successful technical and professional career.

PEO – 2 : Graduates of the program will reveal life-long learning to enhance technical skills and Managerial skills.

PEO – 3 : Graduates of the program will undertake societal responsibilities with ethical practice.

Programme Specific Outcomes (PSOs)

Foundation of Electrical Engineering: Ability to understand the principles and working of electrical components, circuits, systems and control that are forming a part of power generation, transmission, distribution, utilization, conservation and energy saving. Students can assess the power management, auditing, crisis and energy saving aspects.

Foundation of Mathematical Concepts: Ability to apply mathematical methodologies to solve problems related with electrical engineering using appropriate engineering tools and algorithms.

Computing and Research Ability: Ability to use knowledge in various domains to identify research gaps and hence to provide solution which leads to new ideas and innovations.

TEAM MEMBERS

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IV Year Student

Mr S Kamalesh,,

III Year Student

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Mr R Swetha, II Year EEE

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Professor & Head

Ms G Selvamathi M.E.,

Assistant Professor / EEE

Velammal Institute of Technology

FOOTSTEPS INTO ELECTRICAL POWER

Pavegen Systems is a technology company that has developed paving slabs to convert energy from people's footsteps into small amounts of electrical power.



History:

Pavegen Systems was founded in 2009 by Laurence Kembell-Cook. Cook, a graduate in Industrial Technology and Design from Loughborough University, took on a university placement with E.ON, and proposed using footfall as a potential power source. The development of the first prototype of the Pavegen flooring tile was funded by a Royal Society of Arts International Design Directions prize. The tile that converts kinetic energy from footsteps into electricity, while collecting data about walking traffic patterns. The first generation tile was made from recycled polymer, with the top surface made from recycled truck tires. Power is generated when a footfall compresses the slab by about 5 mm (0.2 in). The exact technology is a secret, but PaveGen officials have said it involves electromagnetic induction by copper coils and magnets. Pavegen says each pedestrian generates enough to run an LED street lamp for 30 seconds. The technology was developed by Pavegen founder Laurence Kembell-Cook. An improved tile was developed in 2016 which, according to the company, improved energy conversion by 'about 20 times..

SOLAR FLOWER TOWER



Solar Flower Tower is a hybrid power generator that utilizes solar and alternative fuels, including diesel fuel, natural gas, liquefied natural gas, biogas, and other biofuels, to provide a constant green power source targeted for community-sized production. A module, dubbed the Solar Flower Tower because it looks like a golden yellow tulip, creates about 100 kW of electricity. The basis of the design is to use solar heated compressed air to spin a micro turbine. What makes the micro turbine unique is the efficiency of smaller power blocks, which allows small-scale construction, meaning simpler operation and less land needed.

Mr E Krishna Prasath, II Year EEE

How The Tower Work

In half an acre of land (about 40% of a football field), a solar tower module is surrounded by thirty heliostats reflecting the sun ray into a special solar receiver inside the module. The receiver heats the turbine's compressed air to about $1,000^{\circ}\text{C}$, and the heated air is sent into the turbine's expander to create electricity

AORA

Formerly known as EDIG Solar, AORA is an Israeli based company that develops solar-hybrid power generators. The EDIG group of companies has contracted engineering project with organizations such as Ministry of Defense (Israel), El Al Israel Airlines, and the National Health Service Provider. EDIG presently has a relationship with the Weizmann Institute of Science, providing engineering services. It was at the Weizmann Institute of Science where the solar thermal technology was developed. After the technology was licensed to EDIG, continued advancement was developed until they decided to turned their new solar division into a sub-company, EDIG Solar, now known as AROA.

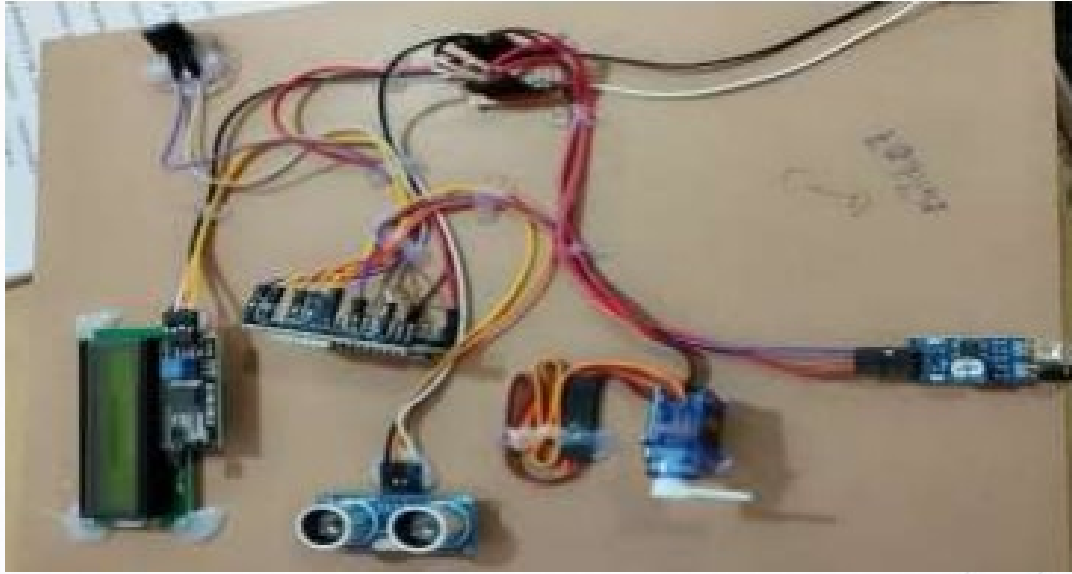
Mr E Krishna Prasath, II Year EEE

Electric Vehicles (EVs) and Charging Infrastructure



Electric Vehicles (EVs) are transforming the future of transportation, offering a cleaner and more sustainable alternative to traditional fuel-powered cars. With advancements in battery technology, improved efficiency, and government incentives, EV adoption is accelerating worldwide. However, one of the biggest challenges remains charging infrastructure—ensuring that EV users have convenient, fast, and reliable charging options. Charging stations are categorized into three types: Level 1 (slow charging at home), Level 2 (faster charging for public and home use), and DC Fast Charging (rapid charging for highways and urban centers). The growth of wireless charging and solar-powered stations is further pushing the boundaries of innovation in this field. Countries are investing in smart grids and vehicle-to-grid (V2G) technology, allowing EVs to supply power back to the grid when needed. Despite the progress, challenges such as high installation costs, uneven charging station distribution, and long charging times still exist. The future of EVs depends on overcoming these hurdles with faster charging technology, widespread station networks, and increased renewable energy integration.

IOT BASED WASTE MANAGEMENT SYSTEM



With the rapid expansion of urban populations, waste management has become a critical challenge. Traditional methods, often based on fixed schedules, are inefficient and lead to issues like overflowing bins, wasted resources, and environmental degradation. An Internet of Things (IoT)-based waste management system provides a forward-thinking solution to these challenges, combining technology with sustainability. This system utilizes smart sensors installed in garbage bins to monitor their fill levels in real time. The sensors transmit data to a centralized platform, enabling authorities to optimize collection schedules and routes. Alerts are generated when bins near capacity, ensuring timely disposal and eliminating unnecessary trips. This approach not only minimizes operational costs but also reduces fuel consumption and carbon emissions. The benefits extend beyond efficiency. By preventing overflowing bins, this system enhances urban cleanliness, improves hygiene, and contributes to a healthier living environment. Additionally, the data collected can be analyzed to identify waste generation patterns, helping cities develop better sustainability strategies. IoT-based waste management exemplifies how technology can address modern urban challenges. It paves the way for smarter cities, cleaner environments, and a future where innovation and sustainability work hand in hand.

DRAWING

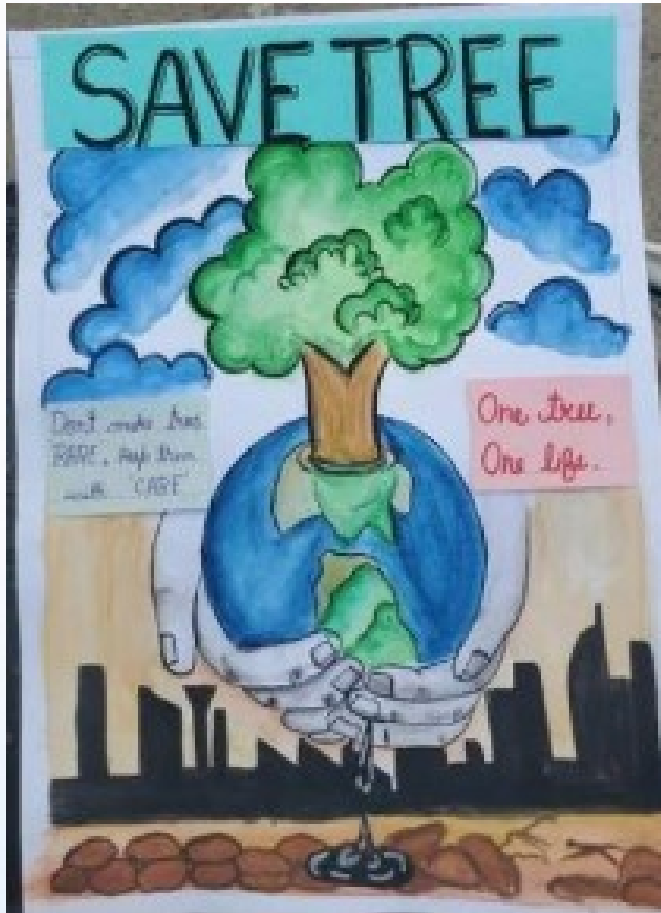


Ms S Jeevitha, III Year EEE



Mr A R Sanjay, II Year EEE

DRAWING



Ms N Priyadharshini, II year EEE



Ms Deepika D, II year EEE

DRAWING



Ms Hari Priya S, III Year EEE



Ms B Hemambika, III Year EEE

POEM

Electricity – The Power of Life

Electricity, silent and bright,
Turning darkness into light.
Flowing fast through every wire,
Giving power we all require.

From homes to schools, from streets to towns,
It lifts our lives and breaks limits down.
Fans that spin and screens that glow,
All work because of its endless flow.

In every spark, in every beam,
It powers progress, fuels every dream.
A force unseen, yet strong and free,
Electricity shapes our destiny.

Handle with care, respect its might,
It brings us comfort day and night.
A modern wonder, pure energy,
The heartbeat of technology.

Mr M Vivek, II Year EEE

POEM

Friendship

A friend is a special gift,
A light that helps your spirit lift.

Through laughter, joy, and every tear,
A true friend is always near.

They stand beside you in every fight,
Turning dark days into light.

Not by blood, but by heart,
True friendship never falls apart.

In every memory, in every mile,
A real friend brings a lasting smile.

Life becomes better in every way,
With a true friend by your side each day.

Mr P Shanmugapandian, II year EEE

கவிதை

இயற்கையும் இயற்கை சீற்றமும்

இயற்கை என்பது இனிய தாய்,
இன்பம் தரும் வாழ்வின் மழை.
பசுமை தரும் மரங்களெல்லாம்,
பாதுகாக்கும் பூமி தாயாம்.

காலை சூரியன் பொன் ஒளியில்,
காற்று வீசும் மென் இசையில்,
ஆறு ஓடும் அமைதியுடன்,
அழகு நிறைந்த உலகமிது நன்றுடன்.

ஆனால் சில நேரம் கோபம் கொண்டு,
அவள் சீற்றம் காட்டும் வேகம் கொண்டு.
புயல் வந்து வீடுகள் சாயும்,
மழை பெருக்கில் நிலங்கள் மூழ்கும்.

நிலநடுக்கம் பூமி குலுக்கும்,
சுனாமி அலை கரையை அழிக்கும்.
இயற்கை சீற்றம் எச்சரிக்கை சொல்வது,
மனிதனுக்கு பாடம் புகட்டுவது.

இயற்கையை நாம் காப்போம் இன்று,
இன்னல் வராது நாளை நன்று.
மரம் நட்டு பசுமை வளர்ப்போம்,
மகிழ்ச்சி நிறைந்த பூமி காப்போம்

செல்வி டி. ஜி. வித்யாஸ் நான்காம் ஆண்டு