



SRI MANAKULA VINAYAGAR

ENGINEERING COLLEGE

(AN AUTONOMOUS INSTITUTION)

**DEPARTMENT OF
ELECTRONICS AND COMMUNICATION ENGINEERING**

ECHOES
Magazine of ECE

2021 - 2022



ABOUT OUR COLLEGE

Sri Manakula Vinayaga Educational Trust was founded to provide quality and affordable education to the weaker sections of society. The trust established Sri Manakula Vinayagar Engineering College (SMVEC) in 1999. SMVEC is an autonomous institution affiliated to Pondicherry University. It offers a variety of undergraduate, postgraduate, and research programs in Engineering, Arts and Science, Allied Health sciences, School of Agriculture, Centre of Legal Education, School of Physiotherapy and School of Pharmacy.

VISION:

To be globally recognized for excellence in quality education, innovation and research for the transformation of lives to serve the society.

MISSION:

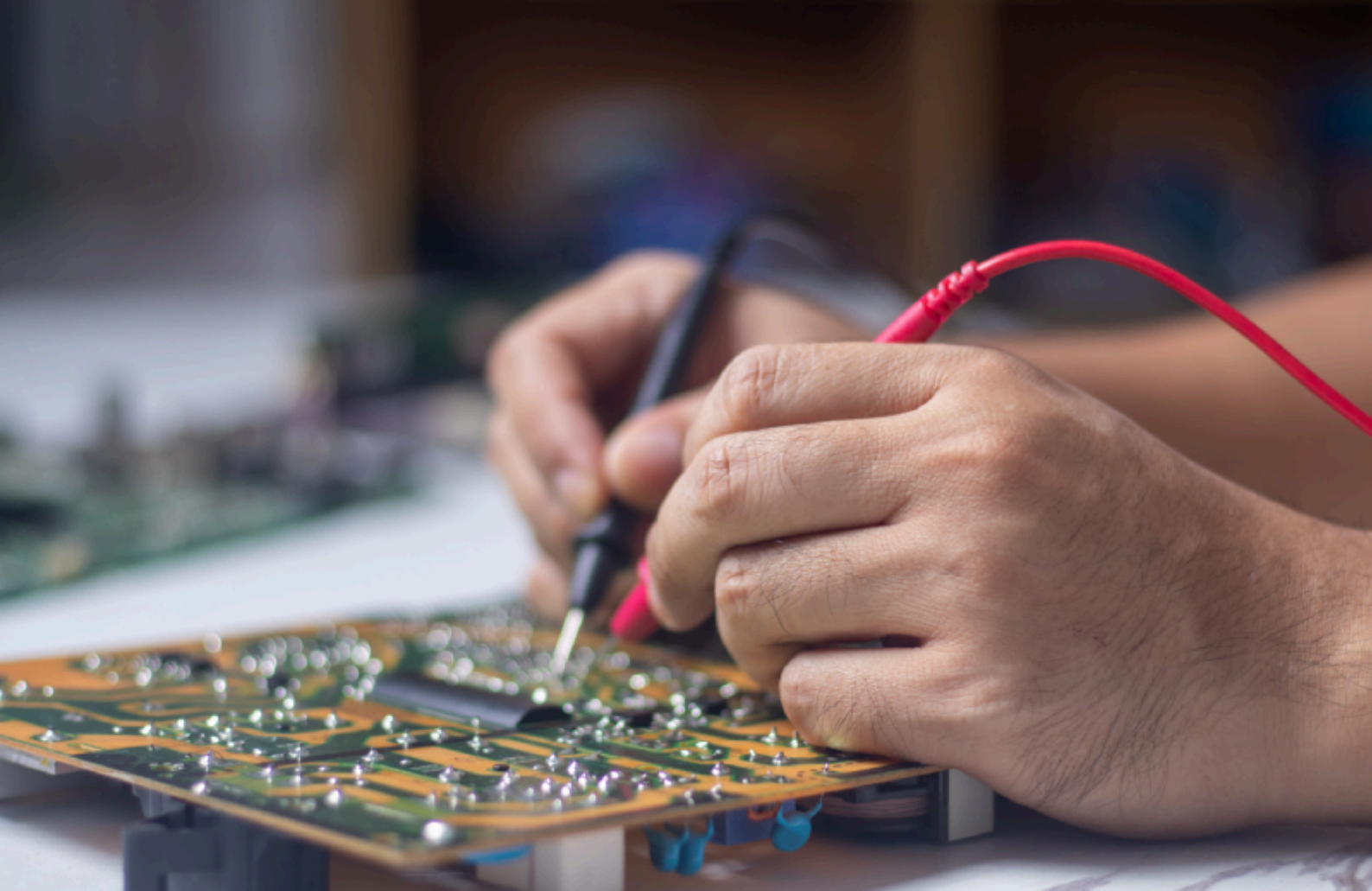
M1: Quality Education: To provide a comprehensive academic system that amalgamates the cutting edge technologies with best practices.

M2: Research and Innovation: To foster value-based research and innovation in collaboration with industries and institutions globally for creating intellectuals with new avenues.

M3: Employability and Entrepreneurship: To inculcate the employability and entrepreneurial skills through value and skill based training.

M4: Ethical Values: To instill a deep sense of human values by blending societal righteousness with academic professionalism for the growth of society.





ABOUT OUR DEPARTMENT

The Electronics and Communication Engineering (ECE) Department, founded in 1999, is dedicated to achieving excellence in learning, teaching, and research. Initially sanctioned with a 180-person intake in 2012, and increased to 240 in 2013. In 2006, the department established a PG programme with an 18-person intake. The B.Tech programme is NBA-accredited till 2025, and the college obtained an “A” from NAAC and Autonomous status in 2019. Our modern laboratories support Electronics, Communication, VLSI, Embedded Technology, and IoT, demonstrating our commitment to offering high-quality education and encouraging intellectual and professional development.

VISION:

Encourage academic excellence and ethical professionalism in Electronics and Communication Engineering to satisfy global needs.

MISSION:

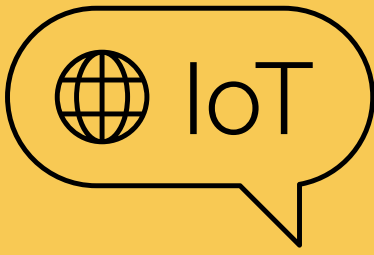
- M1: Prepare students for global issues in ECE.
- M2: Promote research and innovation excellence.
- M3: Increase employability and entrepreneurial abilities.
- M4: Teach human values and professional ethics.

EMPHERICAL STUDY

Internet of Things (IoT) Applications

The Internet of Things (IoT) is a revolutionary concept in electronics that enables physical devices to connect to the internet and interact with each other through data exchange, automation, and intelligent control. These devices, embedded with sensors, actuators, microcontrollers, and communication modules, collect real-time data from their environment and send it to the cloud or local processing units for analysis and decision-making. IoT applications are transforming nearly every sector, including home automation, healthcare, agriculture, industry, and smart cities. In smart homes, IoT devices such as smart thermostats, intelligent lighting systems, security cameras, and voice-controlled assistants like Alexa and Google Home offer convenience, energy efficiency, and safety by learning user behavior and automating functions accordingly. In healthcare, wearable devices like smartwatches, fitness bands, and connected medical instruments continuously monitor health metrics such as heart rate, oxygen level, ECG, and temperature, allowing remote patient monitoring, early diagnosis, and emergency alerts, which is especially useful for chronic conditions and elderly care. The industrial sector utilizes Industrial IoT (IIoT) for predictive maintenance, asset tracking, energy management, and factory automation, where sensors detect machine performance, environmental conditions, or system errors, enabling preventive measures that reduce downtime and increase productivity. In agriculture, IoT supports precision farming through sensors that monitor soil moisture, pH levels, weather conditions, and crop health. Automated irrigation systems and drone surveillance help optimize resource usage, increase crop yields, and reduce human effort. Smart city applications of IoT include intelligent traffic control systems, automatic street lighting, air and noise pollution monitoring, waste management systems, and smart parking, all contributing to improved quality of life, reduced environmental impact, and efficient urban planning. The core components of any IoT system include sensors to collect data, connectivity modules such as Wi-Fi, Bluetooth, ZigBee, LoRaWAN, or NB-IoT for communication, cloud or edge computing platforms to process and store data, and user interfaces like mobile apps or dashboards for control and visualization. These systems rely on microcontrollers such as Arduino, ESP32, Raspberry Pi, or STM32 for embedded control, and cloud services like AWS IoT, Microsoft Azure, and Google Cloud to handle analytics, automation, and data storage. With the growing adoption of edge computing, data can now be processed closer to the source, reducing latency and bandwidth usage. Despite the many benefits, IoT faces several challenges including security vulnerabilities due to the large number of connected nodes, data privacy concerns with constant data transmission, lack of device standardization that hampers interoperability, power management issues in battery-operated devices, and reliance on uninterrupted network connectivity. Cybersecurity threats such as unauthorized access, data theft, and device hijacking are major concerns, prompting the use of encryption, secure boot processes, firmware updates, and authentication protocols to protect the network. To address interoperability, standard protocols like MQTT, CoAP, and RESTful APIs are used to allow seamless integration across devices and platforms.

Wearable Electronics



Wearable electronics represent one of the fastest-growing and impactful domains within modern electronics, combining miniaturized electronic components, smart sensors, wireless communication, and ergonomic design into devices that can be comfortably worn on the human body.

These devices are capable of continuously monitoring, collecting, and processing real-time data related to health, fitness, environment, and location, making them highly relevant in sectors like healthcare, sports, entertainment, defense, and personal safety. The most recognizable examples of wearable electronics are smartwatches and fitness bands that track steps, heart rate, calories burned, sleep cycles, and blood oxygen levels using integrated sensors like accelerometers, gyroscopes, photoplethysmographs (PPG), temperature sensors, and SpO₂ monitors.

More advanced wearables can monitor electrocardiograms (ECG), detect irregular heartbeats, and even alert users to possible medical emergencies, making them critical tools for patients with chronic illnesses or those undergoing rehabilitation. These devices communicate with smartphones or cloud platforms via Bluetooth Low Energy (BLE), Wi-Fi, or NFC, where the data is logged, analyzed, and visualized through mobile applications or web interfaces, enabling users and healthcare providers to make informed decisions. Beyond health and fitness, wearable technology has found significant applications in sports, where athletes use sensor-embedded clothing or shoes to measure muscle activity, motion dynamics, and biomechanical parameters for performance enhancement and injury prevention.

SRINIVASAN B
IV YR B SEC

Edge Computing in Embedded Systems

Edge computing in embedded systems is a transformative approach in electronics where data processing and analysis occur close to the source of data generation—such as sensors and IoT devices—instead of relying on centralized cloud servers, thereby reducing latency, bandwidth usage, and dependency on constant internet connectivity. This paradigm is especially valuable in time-sensitive applications such as autonomous vehicles, industrial automation, healthcare monitoring, robotics, and smart surveillance systems where milliseconds can determine outcomes. Traditional embedded systems typically collect data and transmit it to the cloud for processing, but edge-enabled embedded systems integrate powerful microcontrollers, digital signal processors (DSPs), and system-on-chips (SoCs) that can perform tasks like signal processing, pattern recognition, decision-making, and control locally. This local intelligence allows systems to react faster and more efficiently, which is critical in scenarios like facial recognition in security devices, real-time anomaly detection in manufacturing, or health alerts from wearable devices.



SUREKA K
III YR A SEC

கணினி காதல்

பைனரி எண்ணில் உருவான காதல்,
 டிஜிட்டல் கனவில் திரையும் கசந்தல்.
 மின்னணு வார்த்தைகள் – இமெயிலில் உரையாடல்,
 ஏ.ஐ. தாண்டிய உணர்வு – மனதின் பாடல்.
 சாதனங்கள் நம்மை இணைக்கும் வழி,
 ஆனால் இதயம் மட்டும் மனிதம் தான் அழகு.

SANJAY KANTH K A
 IV YR A SEC

இயற்கையின் இசை

மழை சொல்கிறதே – ஒரு பாட்டாக,
 பூக்கள் நசுக்குது – ஓர் வாசமாக.
 மரங்கள் துள்ளுது காற்றின் தாளத்தில்,
 பூஞ்சோலை துள்ளுது பசுமை யாழத்தில்.
 இயற்கை ஒரு கவிஞன், காலமென்ற கவிதை,
 அதன் வரிகள் நம்மை வாசிக்க வைத்திடும் திடை.

SNEGHAA M
 III YR A SEC

நிலாவின் நிழல்

நிலா வருவாள் – இரவின் தோழி,
 நிமிர்ந்த வானில், ஒரு வெள்ளி மழைதுளி.
 அவளின் நிழலில் கவிதை பிறக்கும்,
 நிசப்த இரவில் நெஞ்சம் நெகிழும்.
 ஒளியும் இருளும் இணையும் சிறகு,
 அதில் பறக்கின்றேன் கனவின் ஓரளவு.

YUVASRI S
 II YR A SEC

தாயின் தொடு

கண்ணில் கனிவாய் விழும் தாயின் பார்வை,
காதில் நெனப்பாய் ஒலிக்கும் வார்த்தை.
அம்மா எனும் சொல் – ஆதிமொழி போல்,
அறிவுக்கு அடிப்படை, உயிருக்கு ஓர் கோல்.
உலகம் சுற்றினாலும் ஒரு இடம் பிழையாது,
அது தாயின் மடியில் தான் அடையும் சாந்தி.

VANAJA M
IV YR B SEC

நேரம் பேசும்

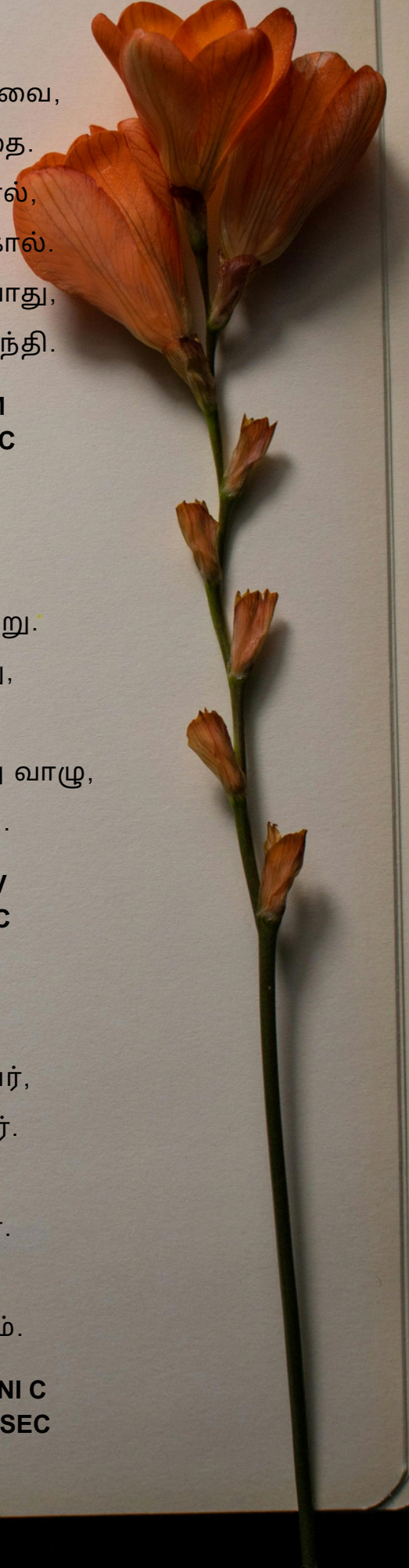
நேரம் ஓடுது நம்மை நோக்கி,
நினைவுகள் விடுதலை தந்த ஒளிக் கீற்று.
கடிகாரம் சுழலும் – வாழ்க்கை பேசுது,
கழிந்த காலம் கற்ற பாடம் சேருது.
இந்நிமிடம் தான் நம் சொந்தம் – உணர்ந்து வாழு,
நாளைய கனவுகள் இன்றே நடக்குது.

YAMUNA V
II YR A SEC

கடவுளும் மனிதனும்

கோவிலில் இல்லை, கரணத்தில் உறைவர்,
கல்லில் இல்லை, கருணையில் வாழ்வார்.
புகழ்ந்தாலும் பரிசளிக்க மாட்டார்,
புரிந்தாலும் பின்பற்ற சொல்ல மாட்டார்.
கடவுளை காண ஆசைப்படாதே,
மனிதனை நேசி – அதுவே அவரது தேசம்.

THARANI C
III YR A SEC



SKETCHING



SANTHIYA B
1 YR / A SEC



SOORIYA I
1 YR / A SEC



T.BALAJI
1 YR / B SEC



BHAVYA.P
1 YR / B SEC



ARTHI S
I YR / C SEC



ASWINI K
I YR / C SEC

TAMIZHARASAN
II YR/ B SEC



BALAJI
II YR/ B SEC

EDITOR PANEL

EDITOR IN CHIEF

Dr. P. Raja

Professor and Head, Dept. of ECE

STAFF COORDINATOR

Ms. A. Preetha

Assistant Professor, Dept. of ECE

STUDENT EDITORS:

1. GOWTHAM S
II YR B SEC
2. KEERTHISHA V
III YR C SEC
3. NITHISH S
III YR A SEC
4. PRAVEEN S
II YR B SEC
5. SINDUJA R
I YR A SEC
6. RAGHAVARDHINI K
IV YR A SEC
7. SHIRISH S
IV YR B SEC
8. PAVITHRA B
III YR A SEC
9. YAMUNA V
I YR C SEC



