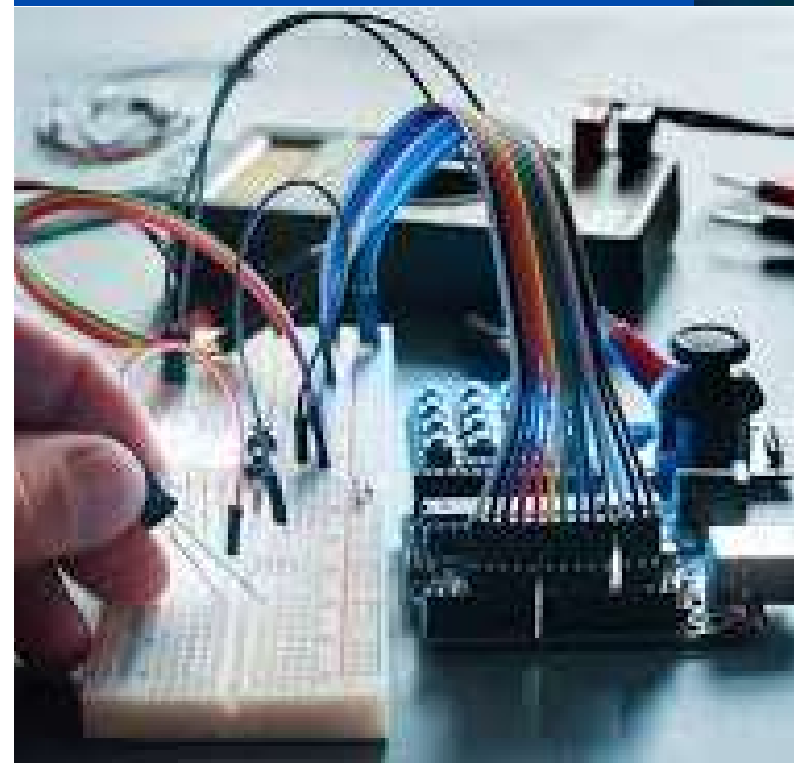
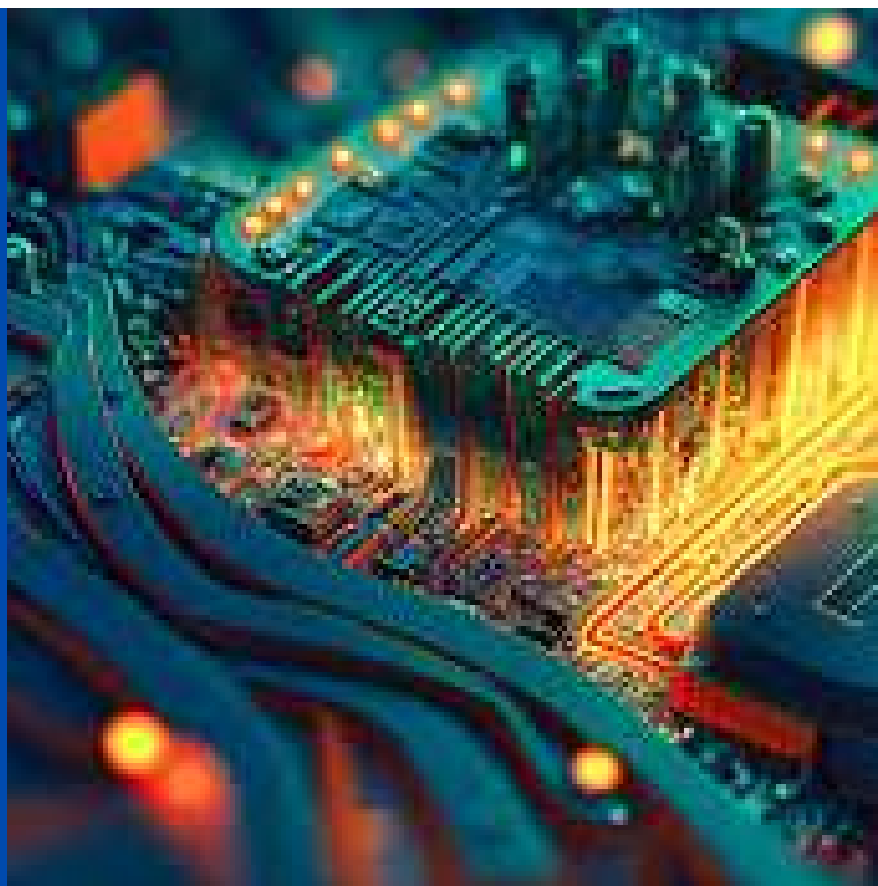




CIRCUIT TIMES

INSIGHTS

- Faculty Article
- Faculty Participation
- Faculty Achievements
- Faculty Proposal Submission
- Student Participation
- Student Achievements
- Academic Events
- Board of Studies Meeting
- Parents Teacher Meeting
- PALS
- BIS Standards Club Activities
- Industrial Visit
- Industry Institute Interaction
- Alumni Activities
- Alumni Testimonial



VISION OF DEPARTMENT

To lead the future of Electronics and Communication Engineering, through developing accomplished people, transformative research, distinguished academics, developing break-through innovations and sustainable solutions to serve society at the national and global level.

MISSION OF DEPARTMENT

By fostering a culture of continuous learning and knowledge acquisition in electronics and communication engineering through rigorous academic programs, research opportunities, industry collaborations, with provision of necessary resources and support.

By nurturing an environment that empowers learners to progress and reach their full potential, contributing to the advancement of Electronics and Communication Engineering and prosper in their careers.

By contributing to society through innovative and sustainable engineering solutions to tackle national and global issues, thereby enhancing the quality of lives and communities.

FACULTY ARTICLE

SLEEP APNEA DETECTION USING SINGLE LEAD ECG SIGNAL

Mr.Kanagaluru Venkatesh, M.E., (Ph.D),

Assistant Professor, Department of Electronics and Communication Engineering,
Sri Venkateswara College of Engineering (Autonomous), Sriperumbudur

ABSTRACT

Sleep apnea is a prevalent sleep disorder characterized by intermittent interruptions in breathing during sleep, leading to serious health complications if left untreated. This project aims to develop a detection system for sleep apnea using a single-lead electrocardiogram (ECG) signal, applying machine learning (ML) and deep learning (DL) algorithms. The proposed system utilizes ECG signals as input to extract relevant features, which are then used to train and evaluate algorithms like Support Vector Machine (SVM), Random Forest, AdaBoost and the deep learning model VGG16. By comparing these algorithms, the project aims to identify the most effective method for detecting sleep apnea. The results indicate that deep learning techniques, particularly VGG16, outperform traditional machine learning approaches, leading to better detection accuracy and improved management of sleep apnea. This project contributes to advancing non-invasive diagnostic methods for sleep disorders by leveraging machine learning techniques.

1.INTRODUCTION

Sleep apnea is one of the most common sleep disorders, characterized by repeated interruptions in breathing due to airway blockages, which can result in oxygen deprivation. The disorder not only affects sleep quality but also increases the risk of cardiovascular diseases, stroke, and metabolic issues. The current gold standard for sleep apnea diagnosis is polysomnography (PSG), a multi-sensor overnight test that monitors various physiological signals. While PSG is highly effective, it is also expensive, cumbersome, and requires a clinical setting, limiting its accessibility. There is a growing demand for simpler, portable, and cost-effective diagnostic tools that can be used outside of clinical environments. In response to this demand, research has shifted towards utilizing electrocardiogram (ECG) signals for sleep apnea detection, given that ECG is a widely available, non-invasive tool.

Machine learning (ML) and deep learning (DL) algorithms are ideal for analyzing ECG signals, as they can automatically detect complex patterns and associations. This project aims to compare several machine learning and deep learning models in their ability to detect sleep apnea using features extracted from single-lead ECG signals. By doing so, we aim to develop an efficient system that can be integrated into portable devices, offering a practical alternative to PSG for early diagnosis of sleep apnea.

2. METHODOLOGY

2.1 Data Acquisition

The dataset used for this project is sourced from the PhysioNet Apnea-ECG Database, which includes recordings from 32 individuals with varying levels of sleep apnea severity. The dataset provides labeled ECG signals with annotations at one-minute intervals, classifying each segment as either normal or indicative of sleep apnea. The recordings were captured using a single-lead ECG system, making it ideal for real-world applications where minimal sensor usage is required.

2.2 Preprocessing

To prepare the data for analysis, several preprocessing steps were applied to the raw ECG signals. First, the signals were segmented into one-minute intervals to match the dataset's labeling. A key step in preprocessing involved applying the Hamilton R-peak detection algorithm to accurately identify R-peaks, which correspond to heartbeats. These R-peaks were used to calculate R-R intervals, representing the time between consecutive heartbeats—a crucial feature for detecting sleep apnea. Noise and artifacts in the ECG signals were mitigated using bandpass filters to isolate the frequency range relevant to heart rate variability (HRV). Additionally, cubic interpolation at 3 Hz was used to ensure that the R-R intervals are sampled uniformly. The preprocessed data was then fed into the machine learning and deep learning models for feature extraction and classification.

2.3 Feature Extraction

Feature extraction is a critical step in the machine learning pipeline, as it involves deriving meaningful information from the raw ECG signals. For this project, features were extracted from the R-R intervals using heart rate variability (HRV) analysis, which captures variations in heart rate that are known to be indicative of sleep apnea.

The extracted features were categorized into three domains:

2.3.1 Time-Domain Features: These include statistical metrics such as mean, median, standard deviation, and variance of the R-R intervals. Additional metrics like SDNN (standard deviation of the R-R intervals) and rMSSD (root mean square of successive differences) were also computed to assess the variability of heart rate over time.

2.3.2 Frequency-Domain Features: The ECG signal was transformed into the frequency domain using spectral analysis. Key metrics such as total power, low-frequency (LF) power, high-frequency (HF) power, and the LF/HF ratio were extracted to understand the balance between sympathetic and parasympathetic nervous system activity, which is affected during apneic events.

2.3.3 Non-Linear Features: These include features that capture the complexity and irregularity of the heart rate signal, such as SD1, SD2 (measures of signal dispersion), and entropy-based metrics like permutation entropy and complexity measures like CVI (Cardio Vagal Index) and CSI (Cardio Sympathetic Index).

A total of 27 features were extracted and used as input for the machine learning and deep learning models. Feature selection methods such as Principal Component Analysis (PCA) were applied to reduce the dimensionality of the feature set, improving computational efficiency and model performance.

3. MACHINE LEARNING AND DEEP LEARNING MODELS:

Several machine learning and deep learning models were evaluated in this study, including:

3.1 Support Vector Machine (SVM): A powerful classification algorithm that finds the optimal hyperplane separating data points into different classes by maximizing the margin between them. A linear kernel was used for this study, given the nature of the ECG data.

3.2 Random Forest: An ensemble learning method that builds multiple decision trees and averages their predictions. This approach is effective in reducing overfitting and provides robust predictions by leveraging multiple classifiers.

3.3 AdaBoost: A boosting algorithm that combines weak classifiers to create a strong classifier by focusing on misclassified samples during training. This iterative process increases the model's accuracy but can be sensitive to noise in the data.

3.4 VGG16: A deep learning model initially designed for image classification tasks but adapted for this project to classify ECG signals. VGG16 utilizes multiple convolutional layers to extract hierarchical features from the input data and has demonstrated strong performance in detecting sleep apnea.

4. RESULTS:

The models were evaluated on their ability to distinguish between periods of normal sleep and those affected by sleep apnea. During testing, the models were tasked with identifying characteristic patterns in ECG signals that indicate apneic events, using extracted features related to heart rate variability and other ECG parameters. The models showed different levels of proficiency in detecting apnea episodes. Traditional machine learning algorithms such as Support Vector Machine (SVM), Random Forest, and AdaBoost performed well in classifying the ECG data into apnea and non-apnea intervals.

However, the deep learning model, VGG16, stood out due to its ability to capture more subtle and complex patterns in the ECG signals. This model was able to automatically learn relevant features from the data, allowing it to handle variations in heart rate and detect apnea events with more precision. It demonstrated a strong ability to generalize across different individuals and apnea severity levels, reducing the number of misclassifications. The results from VGG16 indicate that it is particularly well-suited for real-world applications where diverse signal inputs and varying apnea conditions need to be handled efficiently.

Overall, the models' performance reflects their ability to correctly classify sleep apnea intervals while minimizing false positives (incorrect identification of normal periods as apnea) and false negatives (missed apnea episodes). This balance ensures the system is reliable for sleep apnea detection, with VGG16 proving to be a strong candidate for use in diagnostic settings due to its robustness and adaptability to different signal variations.

FACULTY PARTICIPATION

(SEMINAR/FDP/STTP/WORKSHOP/ONLINE COURSE/CONFERENCE)

- **Mr.L.K.Balaji Vignesh and Dr.S.Pattunnarajam** have participated in **Six Days National Level Faculty Development Program (Virtual Mode)** on the topic of **“Next Generation Embedded Systems”** organized by Department of Electronics and Communication Engineering, Rajalakshmi Engineering College (Autonomous), Thandalam from 09.09.2024 to 14.09.2024



- **Dr.S.Pattunnarajam and Mrs.S.M.Mehazabeen** have presented a paper titled **“Smart Gyro for Parkinson’s Patients”** in **67th Annual IETE Convention (AIC)** on the theme of **“Emerging Technologies and Applications using AI”** organized by IETE, Bhopal from 14.09.2024 to 15.09.2024



FACULTY PARTICIPATION

(SEMINAR/FDP/STTP/WORKSHOP/ONLINE COURSE/CONFERENCE)

- **Dr.S.Pattunnarajam, Mrs.S.M.Mehazabeen and Dr.S.Vidhyashree** have presented a paper titled **“Automatic Irrigation Robot”** in **67th Annual IETE Convention (AIC)** on the theme of **“Emerging Technologies and Applications using AI”** organized by **IETE, Bhopal** from **14.09.2024 to 15.09.2024**



- **Dr.G.A.Sathish Kumar, Professor/ECE** has attended **Annual Convention meeting with MoU Partner Institutes (Computer and Electronics Engineering)** organized by **Bureau of Indian Standards (BIS)** from **27.09.2024 to 28.09.2024**



- **Mr.P.Arul** has attended **Six-day Faculty Development Programme (FDP)** on the topic of **“Next Generation Educators: Harnessing the power of Machine learning”** organized by **Jeppiaar Institute of Technology (Autonomous), Sriperumbudur** from **25.09.2024 to 01.10.2024**

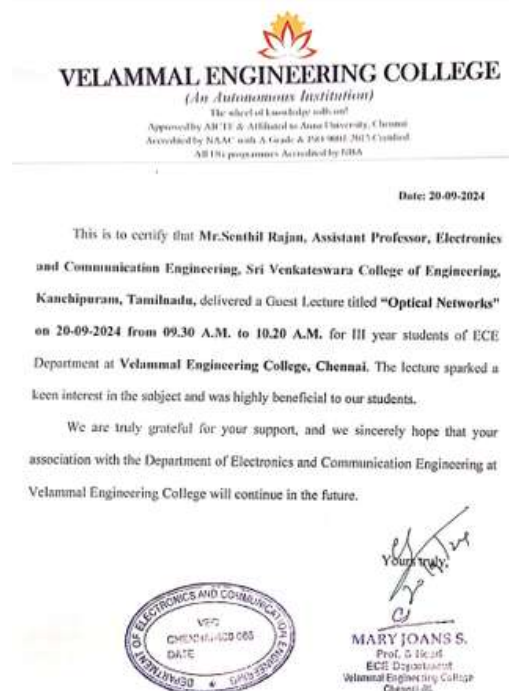


FACULTY ACHIEVEMENTS

- **Mrs.B.Elakkiya, AP/ECE** has delivered a guest Lecture on the topic of **“Machine learning and its application”** organized by the Department of Electronics and Communication Engineering held at **Vel Tech High Tech Dr.Rangarajan Dr.Sakunthala Engineering College (Autonomous), Chennai** on **12.09.2024**
- **Mr.A.Mahadevan, AP/ECE** has delivered a guest Lecture on the topic of **“RF Filter Design”** for **third year ECE Students** organized by the Department of Electronics and Communication Engineering held at **Loyola Institute of Technology, Chennai** on **14.09.2024**

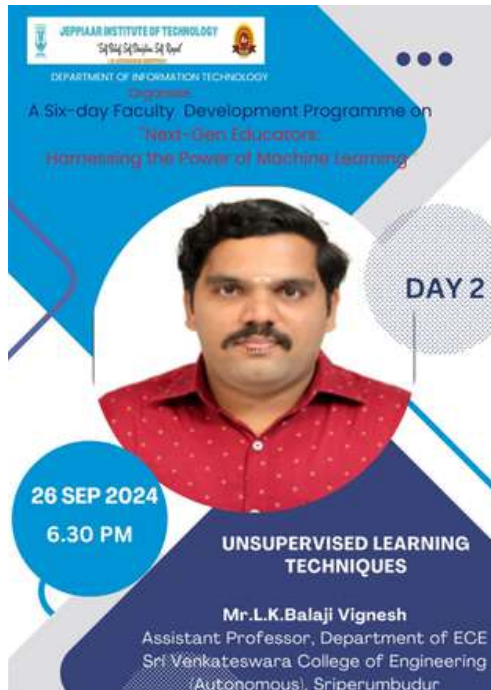


- **Mr.S.Senthil Rajan, AP/ECE** has delivered a guest Lecture on the topic of **“Optical Networks”** for **third year ECE Students** organized by the Department of Electronics and Communication Engineering held at **Velammal Engineering College (Autonomous), Chennai** on **20.09.2024**



FACULTY ACHIEVEMENTS

- **Mr.L.K.Balaji Vignesh, AP/ECE** acted as a session speaker under the topic of **“Unsupervised Learning Techniques”** for Six-day Faculty Development Programme (FDP) on **“Next Generation Educators: Harnessing the power of Machine learning”** organized by **Jeppiaar Institute of Technology (Autonomous), Sriperumbudur** on **26.09.2024**



- **Dr.T.J.Jeyaprabha, ASP/ECE** has received **“IETE Outstanding Faculty Award”** for their outstanding contribution towards Research activities, Industrial Projects, Organizing Events, Collaboration with professional bodies and Industrial Organizations for the student community development during **IETE Teacher’s Day & ENGINEER’S DAY Celebration-2024** organized by **IETE Chennai Centre** on **29.09.2024**



FACULTY ACHIEVEMENTS

- Mrs.S.M.Mehazabeen, AP/ECE and Mr.L.K.Balaji Vignesh, AP/ECE have received “Certificate of Appreciation” for their outstanding contribution towards Research activities, Industrial Projects, Organizing Events, Collaboration with professional bodies and Industrial Organizations for the student community development during IETE Teacher’s Day & ENGINEER’S DAY Celebration-2024 organized by IETE Chennai Centre on 29.09.2024



- Mr.L.K.Balaji Vignesh, AP/ECE has reviewed the paper on the topic of “Intelligent Waste Management Through Automated Sorting for Enhanced Recycling and Sustainability” in STM Journals (International Journal of Electronic Design Technology) on 30.09.2024
- Mr.L.K.Balaji Vignesh, AP/ECE has reviewed the paper on the topic of “Enhancing Irrigation Efficiency Through Machine Learning and IoT Integration” in STM Journals (International Journal of Electronic Design Technology) on 30.09.2024
- Dr.P.Pattunnarajam, ASP/ECE has recognized as a Supervisor (Ref.No.4490012) for guiding Ph.D scholars under the faculty of Electronics and Communication Engineering at Anna University, Chennai. (Area of specialization: Analog VLSI, Digital VLSI Testing, Testing of VLSI Circuits and NanoElectronics)

FACULTY PROPOSAL SUBMISSION

- **Mr.L.K.Balaji Vignesh**, Mr.S.Ashish, Mr.K.Jagadish and Mr.B.Aadhitya Narayanan submitted TNSCST Project proposal titled “**Smart Glove Assisted ASL Learning**” on 04.09.2024
- **Dr.R.Gayathri**, Mr.R.Parvesh, Mr.Ram Solaiappan and Mr.V.Kiran Yadav submitted TNSCST Project proposal titled “**Emergency Communication Device for Fishermen using LoRa-Mesh Based Network**” on 05.09.2024
- **Dr.R.Gayathri**, Mr.L.Sharad, Ms.Stefanie M Olivia, Ms.P.M.Tamizharasi and Mr.K.Udhaya submitted TNSCST Project proposal titled “**Muscle-Driven Bionic Hand: Harnessing EMG for Intelligent Bionic Hand Control**” on 05.09.2024
- **Dr.D.Menaka**, Ms.M.Angelin Sheju, Ms.A.Dharani and Ms.D.Jeevalatha submitted TNSCST Project proposal titled “**Automated Detection of Cardiac Abnormalities in ECG Signals**” on 05.09.2024
- **Dr.D.Menaka**, Ms.S.Anishaa, Ms.P.C.Dhanshrepriya and Ms.A.M.Gogulapriya submitted TNSCST Project proposal titled “**AI-Driven audio watermarking for copyright protection in music tracks**” on 05.09.2024
- **Dr.M.Athappan**, Ms.P.Meenaloshini, Mr.R.Praveen Kumar and Ms.S.Priyadharshini submitted TNSCST Project proposal titled “**Autonomous Mobile Industrial Robot for Warehouse Monitoring and Material Transport**” on 05.09.2024
- **Dr.S.Vijayanand**, Mr.B.Giritharan, Mr.L.Daniel Johnson and Mr.R.Giri Prasath submitted TNSCST Project proposal titled “**Design and Implementation of an Energy Metering System to Recognize the Household Electrical Energy Consumption Pattern Through an IOT**” on 05.09.2024
- **Mrs.K.S.Subhashini**, Mr.A.Logeshwar and Mr.R.M.Manikandan submitted TNSCST Project proposal titled “**Robotic Companion For Personalized Home Care**” on 05.09.2024
- **Mrs.B.Sarala**, Mr.S.Umesh Anandh, Mr.K.R.Tharun and Mr.S.Surya Prakash submitted TNSCST Project proposal titled “**VLSI Implementation of Quantum Chaotic map and DNA encoding based cryptoprocessor**” on 05.09.2024
- **Mrs.S.M.Mehzabeen**, Mr.S.Magesh, Mr.S.Kiran Sekar, Mr.J.Robin Kumar and Mr.B.Nithish Kumar submitted TNSCST Project proposal titled “**Design and Development of a Hydrophone system to monitor White leg shrimp feeding behavior and optimize feeding schedules**” on 05.09.2024
- **Mr.P.Arul**, Mr.A.S.Praveen, Ms.S.Priyadharshini and Ms.B.Priyadharshini submitted TNSCST Project proposal titled “**IoT-Driven Predictive Maintenance System for Equipment in Small-Scale Factories**” on 05.09.2024
- **Dr.S.Vidhyashree**, Ms.N.G.Arthiya, Ms.B.Aruna and Ms.N.S.Bhuvaneshwari submitted TNSCST Project proposal titled “**Characteristics Mode Analysis and Implementation of Dual Band Flexible MIMO millimeter wave Antenna for wearable Electronics Applications**” on 05.09.2024
- **Dr.R.Gayathri**, **Dr.N.Kumaratharan**, **Dr.D.Menaka**, **Mrs.K.S.Subhashini**, **Mrs.S.Kalyani**, **Mrs.L.Anju** and **Mrs.S.M.Mehazabeen** submitted a FDP proposal to AICTE ATAL online FDP scheme titled “**FDP on AI-Driven Predictive Models for Early Disease Detection and Prevention**” on 13.09.2024

FACULTY PROPOSAL SUBMISSION

- **Dr.T.J.Jeyaprabha, Dr.M.Bindhu, Mrs.R.Kousalya and Mrs.B.Sarala** submitted a FDP proposal to AICTE ATAL online FDP scheme titled “**FDP on Blue Technology and Innovation for Sustainable Ocean Economy**” on 13.09.2024
- **Dr.D.Menaka, Mrs.K.Srividhya, Mrs.S.Kalyani, Mrs.L.Anju and Mr.M.K.Varadarajan** submitted a FDP proposal to AICTE ATAL online FDP scheme titled “**FDP on AI and ML for Biomedical Signal Analysis**” on 13.09.2024

STUDENT PARTICIPATION

(Co-curricular Activities/Extra-curricular Activities)

- Mr.R.M.Sai Sandeep and Mr.S.T.Saran (III Year ECE) has participated in **Codecraft 24 (SIH Internal Hackathon)** held at Sri Sairam College of Engineering (Autonomous), Chennai from 02.09.2024 to 03.09.2024
- Ms.K.Jeevitha (IV Year ECE), Mr.B.G.Vikaash, Mr.S.K.Vikash, Ms.V.Sai Sruthi, Ms.K.Tanushri, Mr.M.Roshan, Ms.V.J.Vaishnavi, Ms.S.Swetha, Ms.V.G.Thanuja, Mr.S.Sakthivel (III Year ECE) has participated in **SIH Internal Hackathon 2024** held at Sri Venkateswara College of Engineering (Autonomous), Chennai from 10.09.2024 to 11.09.2024



- Mr.T.Abishek, Mr.G.Gandha Kumar, Mr.B.Achuthan, Ms.S.Dharshini (II Year ECE) has participated in **SIH Internal Hackathon 2024** held at Sri Venkateswara College of Engineering (Autonomous), Chennai from 10.09.2024 to 11.09.2024
- Ms.D.R.Vandhanaa Devi (III Year ECE) has participated in a paper presentation held at **SIMATS (Saveetha University), Chennai** on 12.09.2024.
- Ms.S.K.Harshinivarsa (II Year ECE) has participated in the event of “**Ampere quest**” held at Sri Venkateswara College of Engineering (Autonomous), Chennai on 18.09.2024
- Mr.K.Yugal Kishore, Mr.M.Shrikanth, Mr.S.Yogeswaren, Mr.S.P.Srivatsan (II Year ECE) has participated in the event of “**Ideation and Hackathon 2.0**” held at **SRM University, Kattankulathur, Chennai** from 19.09.2024 to 20.09.2024



STUDENT PARTICIPATION

(Co-curricular Activities/Extra-curricular Activities)

- Ms.G.Athmaja (I Year ECE) have participated in workshop held at Indian Institute of Technology, Chennai on 22.09.2024
- Mr.S.K.Vikash (III Year ECE) has participated in a paper presentation held at Sri Sairam Institute of Technology (Autonomous), Chennai on 24.09.2024.



- Ms.Sanjana Praveen Kumar, Mr.S.Sudhan (II Year ECE) has participated in the workshop of “Azure Essentials Data Engineering” held at Sri Venkateswara College of Engineering (Autonomous), Chennai on 25.09.2024
- Mr.B.L.Karthik Krishna (III Year ECE) has participated in the event of “Mock Parliamentary Session” held at Sri Venkateswara College of Engineering (Autonomous), Chennai from 26.09.2024 to 27.09.2024



- Ms.S.Raksheda (II Year ECE) have participated in the event of “Cybersecurity Workshop” held at SSN College of Engineering (Autonomous), Chennai on 27.09.2024
- Mr.R.J.Shachindra (III Year ECE) have completed the online course in the topic of “Accenture-Data Analytics and Visualization Job, Data Science” organized by UdeMy on 30.09.2024

STUDENT ACHIEVEMENTS

(Co-curricular Activities/Extra-curricular Activities)

- Mr.K.Sree Sanjay, Mr.R.Prapanchan and Mr.S.R.Vignesh (III Year ECE) has presented a paper titled “Smart AI Traffic Management System” and secured first place (Cash Prize of Rs.2000) held at Sri Sairam Engineering College (Autonomous), Chennai on 11.09.2024



- Mr.M.Roshan, Mr.B.G.Vikaash (III Year ECE) have presented a paper titled “Smart Gyro for Parkinson’s Patients” in 67th Annual IETE Convention (AIC) on the theme of “Emerging Technologies and Applications using AI” organized by IETE, Bhopal from 14.09.2024 to 15.09.2024



- Mr.S.Lohith Ashwa (II Year ECE) have presented a paper titled “Automation Irrigation Robot” in 67th Annual IETE Convention (AIC) on the theme of “Emerging Technologies and Applications using AI” organized by IETE, Bhopal from 14.09.2024 to 15.09.2024



STUDENT ACHIEVEMENTS

(Co-curricular Activities/Extra-curricular Activities)

- **Mr.A.Aadhithya Narayanan (I Year ECE), Mr.G.Sathyajith (III Year ECE)** got **runner-up** positions in **Badminton (Men)** in the **Anna University Zone II** tournament organized by Sri Venkateswara College of Engineering (Autonomous), Chennai on 25.09.2024
- **Mr.M.Ramanathan (III Year ECE)** got **runner-up** positions in **Tennis (Men)** in the **Anna University Zone II** tournament organized by CEG, Chennai on 26.09.2024



- **Mr.Haresh Krishna, Ms.Balasaraswathy and Ms.V.T.Harinee (III Year ECE)** has participated in the event of “**Hackinfinity**” and secured **second place (Cash Prize of Rs.8000)** held at SSN College of Engineering (Autonomous), Chennai from 27.09.2024 to 28.09.2024 (**Under the guidance of Dr.T.J.Jeyaprabha, Associate Professor/ECE**)



- **Mr.Haresh Krishna and Ms.V.T.Harinee (III Year ECE)** has participated in the event of “**Paper Presentation Contest**” and secured **second place (Cash Prize of Rs.3500)** held at SSN College of Engineering (Autonomous), Chennai on 27.09.2024 (**Under the guidance of Dr.T.J.Jeyaprabha, Associate Professor/ECE**)



STUDENT ACHIEVEMENTS

(Co-curricular Activities/Extra-curricular Activities)

- **Ms.B.Bavithra and Ms.A.Gayathri (III Year ECE)** has participated in the event of **“Ecofusion”** and secured **second place (Cash Prize of Rs.2000)** held at SSN College of Engineering (Autonomous), Chennai from 27.09.2024 to 28.09.2024



- **Ms.B.Bavithra and Ms.A.Gayathri (III Year ECE)** has participated in the event of **“Solder it”** and secured **first place (Cash Prize of Rs.3000)** held at SSN College of Engineering (Autonomous), Chennai from 27.09.2024 to 28.09.2024



- **Ms.B.Bavithra and Ms.A.Gayathri (III Year ECE)** has participated in the event of **“Pitch it Please”** and secured **second place (Cash Prize of Rs.2000)** held at SSN College of Engineering (Autonomous), Chennai from 27.09.2024 to 28.09.2024



STUDENT ACHIEVEMENTS

(Co-curricular Activities/Extra-curricular Activities)

- Mr.S.Adarsh, Ms.V.Agnes Rose, Mr.K.Aswin Kumar, Mr.V.Sai Sruthi and Mr.S.K.Vikash (III Year ECE) has participated in the event of “Innovente Healthathon” and secured **second place (Cash Prize of Rs.2000)** held at SSN College of Engineering (Autonomous), Chennai from 27.09.2024 to 28.09.2024



- Ms.S.K.Yaaminy and Ms.R.Srimathi (III Year ECE) has participated in the event of “Pitch it Please” and secured **first place (Cash Prize of Rs.3000)** held at SSN College of Engineering (Autonomous), Chennai from 27.09.2024 to 28.09.2024



- Ms.R.Bawadharani Sree (II Year ECE) has participated in the event of “Ecofusion” and secured **third place (Cash Prize of Rs.500)** held at SSN College of Engineering (Autonomous), Chennai from 27.09.2024 to 28.09.2024

EVENTS ORGANIZED

- The Department of ECE and Department of Information Technology organized a guest lecture on “**RF Energy Harvesting Opportunities for Low Power Devices**” on 18.09.2024 from 1.30 p.m to 3.15 p.m at Library Seminar Hall. The session was handled by **Dr. Manee Sangaran Diagarajan** Lecturer, School of Engineering, Faculty of Innovation and Technology, Taylor’s University, Malaysia.



SRI VENKATESWARA COLLEGE OF ENGINEERING
Pennalur, Sriperumbudur Taluk - 602117

**DEPARTMENT OF ELECTRONICS AND COMMUNICATION
ENGINEERING**

and

DEPARTMENT OF INFORMATION TECHNOLOGY

Solicit your esteemed presence for the

Guest lecture

On

“RF Energy Harvesting Opportunities for Low Power Devices”

by

Dr. Manee Sangaran Diagarajan

Lecturer, School of Engineering,
Faculty of Innovation and Technology,
Taylor’s University,
Malaysia

DATE : 18.09.2024
TIME : 01.30 PM
VENUE : Library Seminar Hall



EVENTS ORGANIZED

- The Department of ECE organized a guest lecture on “**Building a network career path towards wireless technologies**” in association with IETE Students Forum on 27.09.2024 from 9.30 a.m to 12.30 p.m at Biotechnology Seminar Hall for III Year ECE Students. The session was handled by **Ms.M.Varshini Gnanam, WLAN Engineer, Zilogic Systems Private Limited, Chennai**. The event was really interactive and students gained more knowledge with the latest equipment used in the networking area towards wireless technologies. The event was organized by **Dr.T.J.Jeyaprabha-Associate Professor/ECE, Mr.L.K.Balaji Vignesh-Assistant Professor/ECE, Mr.A.Mahadevan, Assistant Professor/ECE and Mr.D.Silambarasan-Assistant Professor/ECE** under the guidance of **Dr.S.Ganesh Vaidyanathan, Principal and Dr.G.A.Sathish Kumar, HOD/ECE**.



BOARD OF STUDIES MEETING

- The Board of Studies meeting for Electronics and Communication Engineering programme (Academic Year 2024-25) was successfully conducted on 19.09.2024 through offline mode at Digital Signal Processing Laboratory between 10.00 AM and 12.00 PM.

Key Agenda for the Board of Studies meeting:

- Amendment in the syllabus of Professional Core (from fifth to eighth semester)/Professional Elective/Open Elective/Value Added Courses.
- New courses to be added in Regulation 2022 (UG/PG).



- **Dr.G.A.Sathish Kumar, Chairman, Board of Studies** welcomed all the members of BoS for the meeting and briefed the following points pertaining to R2022.
 - a) B.E Honors & Minor
 - b) Verticals, Open elective, and Value-added courses introduced in ECE.
 - c) Semester Abroad Program.
- **Chairman of BoS** thanked Anna University Nominee, Malar electronic Representative, Meritorious Alumnus, External College Representative for valuable suggestions in new courses and syllabus under each vertical and recommended the same for submission before Academic Council members.

PARENTS TEACHER MEETING

- The Parents Teacher Meeting for Electronics and Communication Engineering programme (Academic Year 2024-25) was successfully conducted on 14.09.2024 between 8.30 AM and 12.05 PM.

- Around 66 Parents (II Year-30, III Year-18 & IV Year-18) attended the parents teacher meeting.

Key Agenda for the Parents Teacher Meeting:

- Parents said it was very useful and faculty freely spoke about wards Progress.
- Parents of hostel students felt that the infrastructure for hostel facilities need to be improved.
- Some Parents requested to improve the transport facilities like increasing the air conditioned buses for some specific routes.
- One Parent suggested to send alert mails/SMS when attendance threshold <85%.
- At the end of the session, the vision, mission and PEO's of the department has been discussed and disseminated to the parents.



PALS

- **Around 120 students** attended the orientation session on the topic of “**IIT PALS GATE/JAM Exam preparation**” on **19.09.2024**
- **One team** submitted Concept and Design document on “**IoT-based emergency response system for ambulance traffic management**” under the theme of “**Social Progress**” to PALS INNOWAH.

BIS STANDARDS CLUB ACTIVITIES

- The Bureau of Indian Standards Club of the Department of Electronics and Communication Engineering, Sri Venkateswara College of Engineering, successfully organized two competitions aimed at familiarizing students with national standards formulation coordinated by BIS-ECE Mentor **Dr.M.Bindhu** and the prizes were distributed by **Dr.G.A.Sathish Kumar, HoD-ECE, SVCE.**
- **Ms.A.Nidharshana (II Year ECE), Ms.R.Amruthaa, Ms.R.Dhanusuya and Mr.S.K.Vikash (III Year ECE)** secured cash prize in **Essay Competition** on the topic of “**INDIAN STANDARDS: IS 15377:2003-DIGITAL SET TOP BOX FOR DTH SERVICE**” (Under the guidance of **Dr.M.Bindhu, ASP/ECE**)

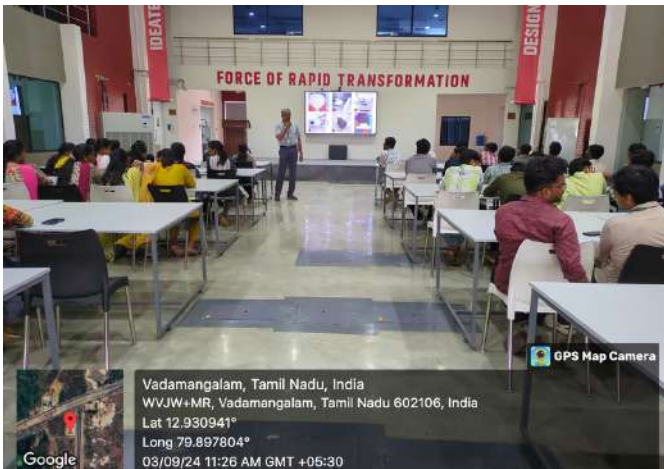


- **Ms.A.Nidharshana and Ms.T.Priyanka (II Year ECE), Ms.B.Bavithra, Ms.A.Gayathri, Ms.V.T.Harinee, Ms.Balasaraswathy, Ms.S.Swetha and Ms.V.SaiSruthi (III Year ECE)** secured cash prizes in **Standard Formulation-Contest** (Under the guidance of **Dr.M.Bindhu, ASP/ECE**)

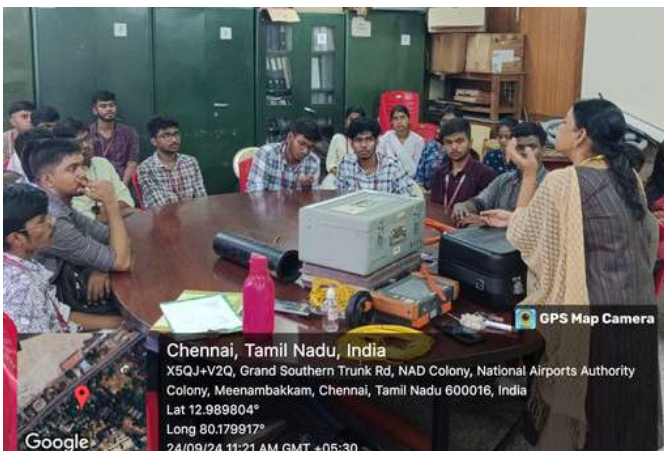


INDUSTRIAL VISIT

- **Around 125 Students from Final-year ECE and Six Faculty Members have undergone Industrial visit to Forge Innovation and Ventures, Sriperumbudur on 03.09.2024 and 06.09.2024**



- **Around 170 Students from Second-year ECE and Six Faculty Members have undergone Industrial visit to BSNL RGM TTC, Meenambakkam from 23.09.2024 to 25.09.2024**



INDUSTRY INSTITUTE INTERACTION

- As part of the Institute-Industry Interaction initiative, the Department of Electronics and Communication Engineering at Sri Venkateswara College of Engineering (SVCE) is happy to share that **Dr.G.A.Sathish Kumar, HoD-ECE**, along with his counterparts, visited the **Tamil Nadu Centre of Excellence for Advanced Manufacturing-TANCAM and Tamil Nadu Smart and Advance Manufacturing Centre of Excellence (TANSAM Center of Excellence)** at TIDEL Park, Chennai on 10th September 2024.
- The visit aimed to explore potential collaborations with TANCAM and TANSAM. This initiative will open doors for enhanced industry interactions, providing our students and faculty access to **cutting-edge advancements in the Industrial sector and Industry 4.0 aligning with UN-SDGs.**



ALUMNI ACTIVITIES

- An Online interaction with HoDs of ECE, Mechanical and CSE department with the alumni **Mr.Murali Murugavel** was conducted on 21.09.2024 to discuss about the Professor of practice and application of patents. **Dr.D.Menaka** and **Mrs.S.Kalyani (Alumni coordinators of ECE department)** coordinated the event.
- **Dr.D.Menaka, Associate Professor/ECE** was appointed as the **Head, Office of Alumni Affairs** in the Executive Committee of **SVCE alumni association** and attended the interaction of new executive committee team members, SVCEAA with the Secretary and Principal on 24.09.2024 at SVCEHT, Kotturpuram.



- **Dr.D.Menaka, Associate Professor/ECE** attended the alumni leadership event conducted by **Vaave Alumni Leadership Program (ALP)** designed for professionals in Alumni Relationship Management specifically at educational institutions. The session was conducted online for 90 minutes on **four respective dates** (30.08.2024 to 31.08.2024, 05.09.2024 to 06.09.2024). The Alumni Leadership Program based on the BEHA Framework addressed key learning tracks such as Alumni Persons, Alumni Flywheel, Alumni Relationship Matrix, AI & Technology in Alumni Relations, 13 Engagement Programs, Alumni Mentoring, ABC's of Fundraising, and Alumni in Institutional Development.



ALUMNI TESTIMONIAL



**Mr.Vignesh Ramji,
Solutions Architect,
Penta Techsecure Electronics LLC, Dubai**

“Volunteers do not necessarily have THE TIME; they have THE HEART”. That one belief led to molding a very playful teenager into a mature, responsible and a goal-driven individual. Blessed with opportunities to represent college in sports, along with a chance to be a part of the student body of ECE. Interaction, communication and a vocal presence were key traits gained both on and off the pitch. All I can do is cherish the lessons taught by my professors, for there is nothing I can do to repay you all adequately for your selfless contribution to my life as well as other students-**Mr.Vignesh Ramji, (Batch 2010-2014)**

PROGRAM OUTCOMES

PO1: Engineering Knowledge: Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems.

PO2: 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.

PO3: 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.

PO4: 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.

PROGRAM OUTCOMES

PO5: 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.

PO6: 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 practice.

PO7: 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.

PO8: Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and team work: Function effectively as an individual and as a member or leader in diverse teams, and in multidisciplinary settings.

PROGRAM OUTCOMES

PO10: 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.

PO11: Project management and finance: Demonstrate knowledge and understanding of the engineering 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.

PO12: Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and lifelong learning in the broadest context of technological change

PROGRAM EDUCATIONAL OBJECTIVES

PEO1: Create value to organizations as an EMPLOYEE at various levels, by improving the systems and processes using appropriate methods and tools learnt from the programme.

PEO2: Run an organization successfully with good social responsibility as an ENTREPRENEUR, making use of the knowledge and skills acquired from the programme.

PEO3: Contribute to the future by fostering research in the chosen area as an ERUDITE SCHOLAR, based on the motivation derived from the programme.

PROGRAM SPECIFIC OUTCOMES

PSO-1: An ability to apply the concepts of Electronics, Communications, Signal processing, VLSI, Control systems etc., in the design and implementation of application oriented engineering systems.

PSO-2: An ability to solve complex Electronics and communication Engineering problems, using latest hardware and software tools, along with analytical and managerial skills to arrive appropriate solutions, either independently or in team.

PROGRAM OFFERED BY THE DEPARTMENT

- **B.E. in Electronics and Communication Engineering**
- **M.E. in Communication Systems**
- **Ph.D / MS (by Research)**

EDITORIAL BOARD

CHIEF EDITOR

Dr.G.A.Sathish Kumar

Professor & Head

Department of ECE

CO-EDITORS

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Assistant Professor/ECE

Dr.G.Ayappan

Assistant Professor/ECE



ELECTRONICS AND COMMUNICATION ENGINEERING

ABOUT THE DEPARTMENT

The Department of ECE was started in the year 1985 and is presently accredited by the NBA. The postgraduate program (M.E) in Communication Systems was started in 2002. There are about 38 faculty members in the department and 14 of them are doctorates. The department is well equipped with lab facilities and software tools like IE3D, ADS, CST Studio, Lab View, Tanner Tools, Cadence, MATLAB, and Prototype Machine.



SALIENT FEATURES OF ECE

- The Program has been accredited by the NBA since April 2002.
- Recognized by Anna University, Chennai as an approved research centre for Ph.D. and MS (by Research) with effect from May 2009.
- The major thrust areas of research are RF and Microwave Engineering, Wireless Networks, Network Security, VLSI, Cognitive Radio, Image & Signal Processing, Neural Networks & Soft Computing, Embedded Systems & IoT, Machine Learning, Nano Technology, Robotics, and Artificial Intelligence.
- The department is doing a good number of consultancy work in the field of PCB Prototyping and RF measurements using a Network Analyzer.
- On average over 75 companies visit our department for campus placements External Research grant of Rs 48.26 Lakhs received from ISRO and Cognizant Technology Solutions in the last five years for carrying out various projects.
- Students actively participate in research projects related to Wireless Communications, Networking, Embedded Systems & IoT, Virtual Reality, Robotics, Drones etc.
- Student Counselling Service at SVCE is committed one to promote the mental health and well-being of our students by providing accessible, quality mental health services.
- Student counsellors are available on campus for confidential counselling to all students.
- The department has signed over 12 MOUs with reputed companies to ensure the Industry Institute Interaction.
- Training programs are being conducted to enhance the employability skills of the students and also to achieve good placement in various Industries.

MESSAGE FROM HoD's DESK

The Department of ECE consistently does a commendable job in disseminating the latest knowledge and inviting specialists from diverse domains for discussions on the most recent advancement and trends besides conducting regular classes. We hope every student who visits our department has an engaging, motivating and positive experience. We consistently strive to ensure that instructors and other staff personnel possess the necessary abilities and knowledge to stimulate their students' intellectual curiosity, creativity and critical thinking. I hope you enjoy your time here and thoroughly use our amenities for promising career development



Dr. G.A. SATHISH KUMAR HoD/ECE

VISIT WWW.SVCE.AC.IN

SCAN & APPLY

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CHOOSING SVCE: A PATHWAY TO SUCCESS AND GROWTH

- One of the prestigious and top ranked Autonomous engineering institution affiliated to Anna University, Chennai.
- Accredited by NAAC and NBA.
- Over 28 % of the alumni work abroad.
- Highest placement offers of Rs.25 LPA and 20 LPA in PayPal and Amazon.
- Highly qualified faculty and staff with an average experience of over 20 years.
- World class Laboratories to foster innovation and research.
- Alumni working in fortune 500 companies like Google, Microsoft, Facebook, Mercedes Benz, INTEL, etc.,
- State-of-the-art-campus with modern amenities in the industrial corridor of Chennai.

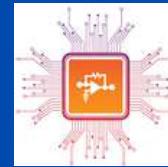


A Bachelor's Degree in Electronics and Communication Engineering with expertise in one of the following specialization

HONOURS SPECIALIZATION



Wireless Communication Systems



VLSI



Antenna and Microwave Technology



Signal Processing and Data Science



IoT Systems and Networking and Security its Applications



Our Recruiting Companies



MINORS



Artificial Intelligence and Machine Learning and Machine Learning



Data Science and Analytics



Robotics



Semiconductors



Advanced Communications



Bio-medical Signal Processing

Top Universities where our students are pursuing Higher Education



And Many More....



DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

M.E COMMUNICATION SYSTEMS

ADMISSIONS OPEN FOR THE ACADEMIC YEAR 2024-25

SVCE started the Department of Electronics and Communication Engineering in the year 1985. The Department offers B.E. in Electronics and Communication Engineering and M.E. in Communication Systems. It is also approved as a Research Centre in Ph.D and MS (by Research) programmes by Anna University, Chennai.



ABOUT SVCE

Sri Venkateswara College of Engineering (Autonomous) is a premier self-financing institution started in the year 1985. The college offers 10 B.E/B.Tech Programmes and 10 M.E/M.Tech Programmes in Engineering and Technology. The Programs are approved by AICTE and the college is affiliated to Anna University, Chennai. The college is also accredited by National Assessment and Accreditation Council (NAAC). Many programs are accredited by National Board of Accreditation (NBA). The college is also certified by ISO 9001:2015. The institution received the autonomous status in the year 2016. Our Vision is to be a leader in Higher Technical Education and Research by providing state-of-the-art facilities to transform the learners into global contributors and achievers.

ADMISSION INFORMATION

A pass in a recognized Bachelor's degree or equivalent in the relevant field and should have obtained atleast 50% in the qualifying degree examination. Admissions are through Tamil Nadu Common Entrance Test (TANCET) conducted by Anna University or GATE

RESEARCH GRANTS

Our faculty members have received major external research grants from prestigious organizations such as ISRO, AICTE, DRDO, and TNSCST, etc., to the tune of ₹56.26 Lakhs in the last three years for doing various funded projects.

SCHOLARSHIPS FOR PG STUDENTS

- Tution fee (Rs. 50,000/year) waiver for 30% of the students of sanctioned class strength on merit basis, as applicable.
- Management Scholarship for tution fees and assistance for books and instruments.
- GATE Scholarship of Rs. 12,400 per month for students having valid GATE Score. Sponsorships for students to attend conferences.
- Intramural M.E/M.Tech Student Research Grant to carry out innovative projects.

RESEARCH AREAS

Join the Revolution: Transform Communication Systems with SVCE

- Biomedical Instrumentation
- Computer Networks & Network Security
- Digital Signal Processing & Image Processing
- Embedded Systems
- Fiber Optic Communication
- IoT (Internet of Things)
- Nano Electronics
- RF & Microwave Engineering
- Robotics & Artificial Intelligence
- VLSI & Microelectronics
- Wireless Communication Networks

MAJOR RECRUITERS

