Four-Day Workshop on *"From Fundamentals to Metamaterials: A Practical Journey in Antenna Design"*

Organized by the Department of Electronics and Communication Engineering, Sri Sairam College of Engineering
Dates: 16th – 20th September 2025 | Time: 9:30 AM – 4:00 PM

The **Department of Electronics and Communication Engineering (ECE), Sri Sairam College of Engineering**, successfully organized a **four-day workshop** titled *"**From Fundamentals to Metamaterials: A Practical Journey in Antenna Design**"* from **16th to 20th September 2025**. The workshop aimed to strengthen students' foundation in antenna theory, while also equipping them with practical skills in using **HFSS simulation software** for antenna design.

A total of **40 participants** from III Year ECE actively took part in the sessions, which were carefully structured to balance **theoretical learning in the mornings** and **hands-on training in the afternoons**.

Inaugural Session

The workshop commenced with great enthusiasm, hosted by **III Year students Abhinaya and Srihitha**.

- The program began with a soulful **Prayer Song by Moulya H. M. (III Year, ECE)**.
- **Dr. A. Poonguzhali, Head of the Department of ECE**, delivered the **welcome address**, emphasizing the importance of bridging fundamentals with advanced research in antenna technology.
- The **Presidential Address** was delivered by **Dr. Shadaksharappa, Principal, SSCE**, who highlighted the significance of such workshops in preparing students for cutting-edge innovations in wireless communication.
- **Abhinaya, III Year student**, introduced the **Chief Guest**, **Dr. Vinoth M., Technical Advisor, Hertzian Morphix Labs, Valasaravakkam, Chennai**.
- The Chief Guest was warmly felicitated by **Dr. Shadaksharappa, Principal, Dr. A. Poonguzhali, Head of the Department of ECE**, and the workshop coordinators**, Dr. Ahila A** and **Dr. Hosanna Princye.P**

Day-wise Workshop Highlights

- **Day 1 – Fundamentals & FEM Basics**
  - *Morning*: Introduction to **Microstrip Patch Antennas (MSPA)**, radiation mechanism, patch effects, and FEM concepts.
  - *Afternoon*: Modeling rectangular patch antennas in HFSS, boundary/port setup, meshing, and extraction of S-parameters and radiation patterns.


SAIRAM
"From Fundamentals to Metamaterials: A Practical Journey in Antenna Design"
Dr. Vinoth M


Sairam


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COLLEGE OF ENGINEERING
Department of Electronics & Communication Engineering
Organizing 4days Workshop on
"From Fundamentals to Metamaterials: A Practical Journey in Antenna Design"
Dr. Vinoth M
Date: 9th to 12th September 2025 @ 10:00 am
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- **Day 2 – Feeding Techniques & Ground Optimization**
  - *Morning*: Inset/Coaxial feed, slots, ground plane optimization, and performance metrics (gain, efficiency, return loss).
  - *Afternoon*: HFSS implementation of inset-fed patch antennas, return loss simulation, ground modification, and optimization techniques.
- **Day 3 – SIW & Antenna Array Structures**
  - *Morning*: Basics of Substrate Integrated Waveguide (SIW), via-holes, dielectric effects, antenna arrays, beamforming, and applications.
  - *Afternoon*: HFSS design of SIW-based antennas, creating a **1×2 antenna array**, comparing single vs. array performance, and beam steering visualization.
- **Day 4 – Resonant Structures, Metamaterials & Metasurfaces**
  - *Morning*: Resonant structures, **SRR/CSRR concepts**, LC equivalence, miniaturization, filtering effects, and metasurface applications.
  - *Afternoon*: Embedding SRR/CSRR in MSPA design, simulating resonance shifts, miniaturization, metasurface integration, and field distribution analysis.

Valedictory Function – 12th September 2025

The workshop concluded with a **Valedictory Function held on 12th September 2025**.

- **Dr. Vinoth M., Technical Advisor, Hertzian Morphix Labs**, graced the occasion and distributed **certificates to all 40 participants**.

- In his closing remarks, he congratulated the students for their enthusiasm and highlighted the importance of continuous practice with HFSS for mastering antenna design.
- The students expressed that the workshop greatly enriched their knowledge of **antenna theory and HFSS simulations**, giving them a strong foundation to explore advanced research areas in antenna engineering.

Key Outcomes

- Students gained **comprehensive knowledge** from microstrip patch antennas to metamaterials and metasurfaces.
- They developed **hands-on expertise** in **HFSS simulation software**, enhancing their practical design and optimization skills.
- The program created a strong bridge between **academic learning and real-world applications**, encouraging students to pursue further innovation in antenna technology.