



Pragati Engineering College
(AUTONOMOUS)



A Report on
Guest Lecture
On
**"ELEMENTARY FUNDAMENTALS OF
EMBEDDED SYSTEMS DESIGN"**

on 13th September 2025

Organized by
DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING
Under
ECE Student Association



Department of Electronics & Communication Engineering
Organizes

A Guest Lecture on
"ELEMENTARY FUNDAMENTALS OF EMBEDDED SYSTEMS DESIGN"

Resource person

Mr. Govinda Rao Velamala

Protective Technologies Private Limited

in collaboration with
Microlink Information Technologies

Date :
13-09-2025



Pragati Engineering College
(AUTONOMOUS)





PRAGATI ENGINEERING COLLEGE

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DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

DATE: 13.09.2025

A Report on Guest Lecture On ELEMENTARY FUNDAMENTALS OF EMBEDDED SYSTEMS DESIGN

On 13th September 2025, the Department of Electronics and Communication Engineering at Pragati Engineering College (Autonomous), Surampalem, organized a Guest Lecture on "Elementary Fundamentals of Embedded Systems Design" under the banner of the IETE Student Forum (ISF).

The session was specially arranged for III and IV B.Tech ECE students to enhance their understanding of embedded system architecture, hardware-software co-design, and real-time system development. The event was coordinated by Dr. V. Radhika, Associate Professor and Faculty Coordinator, IETE, Department of ECE.

The session took place in Seminar Hall - 1 from 9:00 AM onwards.

About the Resource Person:

Mr. Govinda Rao Velamala, Senior Embedded Systems Engineer at Protective Technologies Private Limited, Hyderabad, is an experienced professional with over 10 years of expertise in embedded systems design and development. He has a strong background in microcontroller-based automation, IoT applications, and real-time system integration, contributing to projects in both industrial and defense sectors. His technical proficiency spans across ARM, PIC, and AVR microcontrollers, firmware programming, and electronic circuit optimization.

He has conducted numerous training programs, workshops, and guest lectures at various engineering institutions, guiding students on practical aspects of embedded design. His sessions emphasize bridging the gap between theory and real-time applications through hands-on learning and exposure to professional tools such as JTAG debuggers, oscilloscopes, and PCB design software. His expertise in Real-Time Operating Systems (RTOS) and low-power embedded architectures has made him a sought-after speaker in the embedded systems domain.

Currently, at Protective Technologies Pvt. Ltd., Mr. Govinda Rao leads several projects focusing on industrial automation, defense-grade controllers, and IoT-based embedded devices. His passion for innovation and teaching inspires young engineers to apply their technical knowledge in solving real-world problems.



Photo of Inviting the Guests on to the dais (Dr. G. Naresh, Prof. and Principal, Recourse Person Mr. Govinda Rao Velamala, Protective Technologies Private limited and Dr. V. Prasanth, Assoc. Prof. and HOD-ECE)

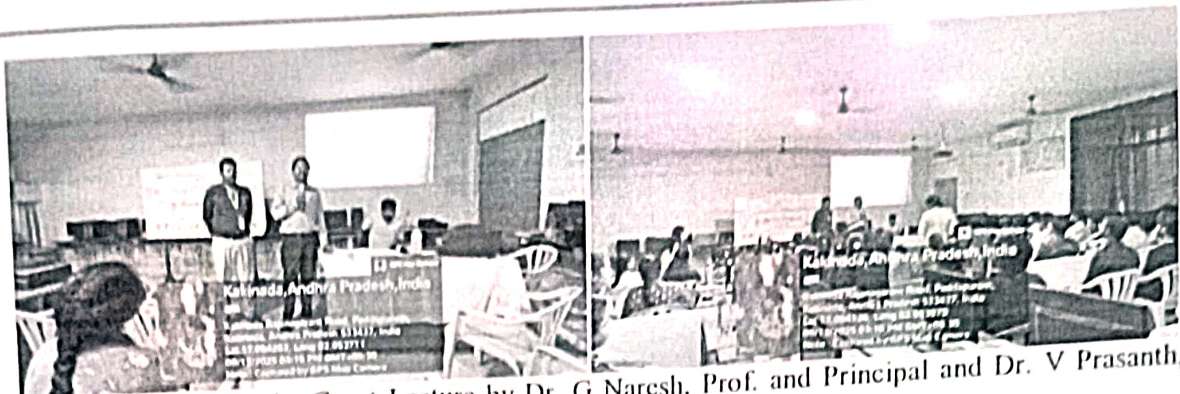


Photo of Addressing the Guest Lecture by Dr. G Naresh, Prof. and Principal and Dr. V Prasanth, Assoc. Prof. and HOD-ECE

Dr. G. Naresh, **Professor and Principal of Pragati Engineering College**, inaugurated the session and delivered an inspiring address. He emphasized that “in today’s rapidly evolving technological era, understanding embedded systems is vital for every electronics engineer. It enables students to move beyond theoretical knowledge and gain hands-on expertise with real-time systems used across industries like IoT, robotics, and automation.” He appreciated the ECE Department and the IETE Student Forum for organizing the session and encouraged students to *actively participate and apply embedded principles in real-world projects*.

Dr. V. Prasanth, **Associate Professor and Head of the Department of ECE**, expressed his pleasure in organizing the lecture. He remarked that “Embedded systems form the backbone of modern electronic design — from consumer devices to space applications. Learning these fundamentals strengthens students’ practical knowledge and boosts their confidence for innovation.” He extended heartfelt thanks to the **resource person, faculty coordinators**, and the **IETE Student Forum** for their efforts in bringing valuable technical exposure to students.

Introduction:

To provide students with deeper insights into the practical aspects of embedded system design, the Department of ECE invited an industry expert to conduct the session. The lecture aimed to bridge the gap between academic concepts and real-time applications. The following is a brief introduction to the esteemed resource person who led the session.

Objective of the workshop:

- To introduce students to the **core building blocks of embedded systems**.
- To explain the **hardware-software interaction** in real-time systems.
- To highlight **design methodologies** for low-power and high-performance systems.
- To motivate students to apply embedded concepts in **academic projects and innovations**.

Session Highlights:

The workshop was conducted by Mr. V. Govinda Raor, who delivered an insightful and interactive session. The following key topics were covered:

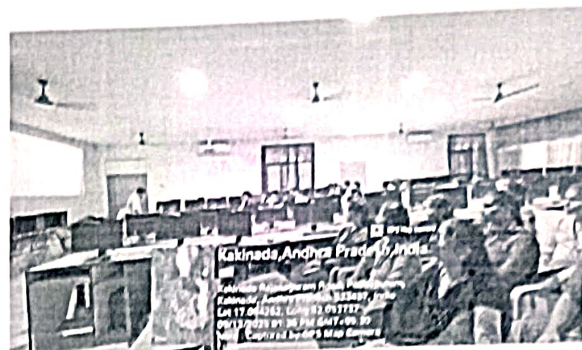
Morning Session (9:00 AM – 12:00 AM)

Topic: Fundamentals and Hardware Design of Embedded Systems

The resource person covered the following key areas:

- Introduction to embedded system architecture.
- Detailed explanation of microcontrollers, memory, and I/O interfaces.

- Demonstration of sensor interfacing and data acquisition using Arduino.
- Importance of power management and hardware reliability in embedded applications.
- Overview of real-time data processing and its relevance in automation systems.



Photos Delivering Lecture on ELEMENTARY FUNDAMENTALS OF EMBEDDED SYSTEMS DESIGN by Resource Person in morning Session

Afternoon Session(1:00PM–3:30PM)

Practical Demonstration:

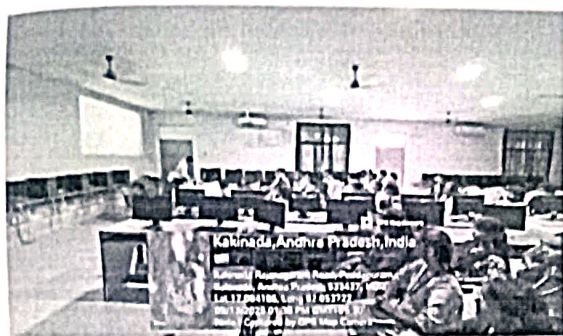
Topic: Software and Firmware Development

Key points covered:

- Explanation of firmware structure and bare-metal programming concepts.
- Introduction to Real-Time Operating Systems (RTOS) and task scheduling.
- Hands-on examples of LED blinking, motor speed control, and signal monitoring.
- Discussion on interrupt handling and PWM control techniques.
- Overview of debugging tools and testing methods like JTAG and oscilloscopes.
- Real-world case studies from automotive and industrial applications.

Key Takeaways

- Students gained a clear understanding of embedded system components and their working.
- They learned about real-time design constraints and the importance of timing accuracy.
- Improved awareness of industrial applications and career opportunities in embedded systems.
- Motivated to explore projects in IoT, automation, and robotics using microcontrollers like ARM and ARDUINO.



Photos of afternoon session

Outcomes:

- Students could identify the **relationship between hardware and software** in embedded systems.
- The lecture encouraged **hands-on experimentation** with microcontrollers.
- Enhanced their understanding of **firmware development processes**.
- Created interest in pursuing **higher studies or careers in embedded and IoT domains**

The session concluded with a **vote of thanks** by **Dr. V. Radhika**, who appreciated **Mr. Govinda Rao Velamala** for sharing his industrial expertise and demonstrating the real-world relevance of embedded system design.

She also thanked the **Principal, HOD-ECE, faculty coordinators, and student volunteers** for their support and active participation.



Photo of Presentation of a memento to the resource person

Participation:

Around 85 students from III and IV B.Tech ECE attended the session and actively engaged in the Q&A segment. Their enthusiasm reflected the growing interest in embedded technologies and system-level design.

Conclusion:

The guest lecture provided an excellent platform for students to gain both **conceptual clarity** and **practical insights** into the design of embedded systems.

Such interactive sessions by industry experts bridge the gap between classroom learning and professional applications, empowering students for future technical challenges.



Group photo taken with Resource Person along with faculty and Students

Lead
Coordinator

