A 6-Day Value Added Course on "Embedded C basic module with practical Sessions"

Organized by : **Department of Electronics & Communication Engineering**

Resource Persons : **1. Mr. P. RAJESH**

2. Mr. Y. KAMAL KUMAR

Designation : **[1] Director, [2] Sr. Engineer**

Venue : **VIDHRA Block 203 & 305**

Date : **01st October'25 to 06th October'25.**

Time : **09.00 am – 04.50 pm**

Conducted for : **IV year students of ECE**

No. of participants :

1. Report in brief by Organizer / Coordinator / Convener

The Department of ECE conducted A 6-Day Value Added Course on "Embedded C basic module with practical Sessions" from 01st October'25 to 06th October'25 at Ramachandra College of Engineering, Eluru.

The course titled *"Embedded C Basic Module with Practical Sessions"* is a specialized training program focused on industry-level embedded coding and Linux mounting. It is highly valuable for enhancing core-side job opportunities.

This value-added course offers a structured, in-depth learning experience in Embedded C programming (with a focus on PIC microcontrollers) and Linux system programming. The curriculum blends theoretical foundations with extensive hands-on sessions, and is specifically tailored for those seeking to develop industry-ready, core engineering skills valuable for embedded and system-level job opportunities.

Embedded C Programming Module Highlights:

Fundamental Concepts:

- Differences between C and Embedded C
- Role in firmware development
- Program structure, compilation, and coding standards

Data Types & Memory:

- Use of basic and fixed-width types
- Volatile and const in embedded systems
- Enumerations, typedef, and efficient memory handling

Operators & Control Structures:

- Arithmetic, logical, and bitwise operations for direct hardware manipulation
- Use of conditional statements and loops for embedded solutions

Modular Programming & Pointers:

- Functions, prototypes, parameter passing, inline/static usage
- Organization of header/source files
- Pointers and their use in hardware register access

Advanced Topics:

- Arrays, structures, unions, memory alignment, and advanced macro usage
- Preprocessor directives, conditional compilation, and code optimization

Practical Applications:

- Real-world practice: LED/blinking logic, button debounce, sensor data handling
- Interview-oriented coding tasks and mock interview rounds

Interview Preparation:

In-depth Q&A on embedded software and PIC hardware topics

Linux System Development Module Highlights:

- Linux & Shell Fundamentals:
- Bash navigation, shell scripting, automation tasks, command-line environments
- System Programming:
- Makefiles and build automation
- Process management: states, creation, scheduling, and signals
- File system operations: descriptors, permissions, file attributes
- Memory Management:
- Virtual vs physical memory, dynamic allocation (malloc, calloc, mmap), fragmentation
- Multithreading & Synchronization:
- POSIX threads, thread creation/termination, mutexes, semaphores, condition variables
- Interprocess Communication (IPC) & Networking:
- Pipes, message queues, shared memory, TCP/UDP sockets
- Mini-projects: client-server programming and debugging
- Industry-Oriented Q&A:
- Shell scripting, system calls, file and memory management, process/thread control, networking, and IPC in Linux.

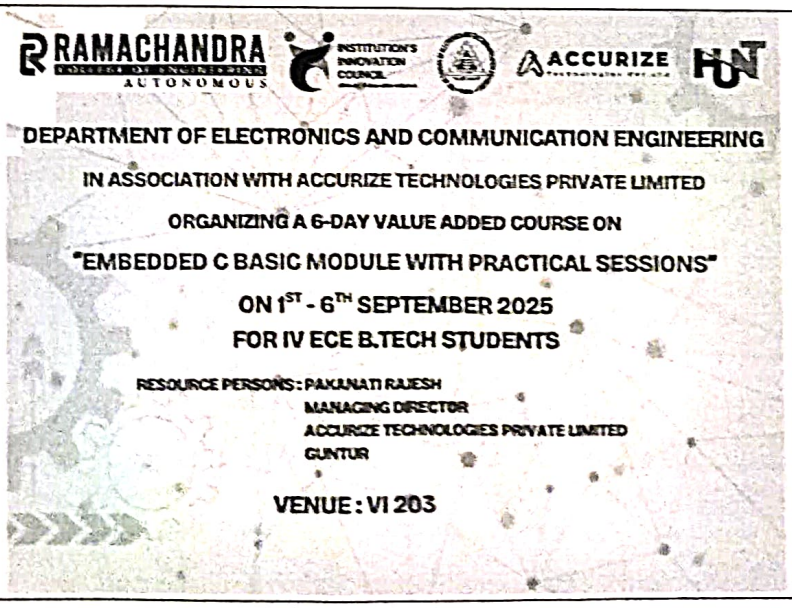
This course is ideal for engineering students, graduate trainees, and professionals aiming for specialized roles in embedded firmware, Linux-based system development, and core areas of the electronics and semiconductor industry.

2. Profile of the Guest (s):

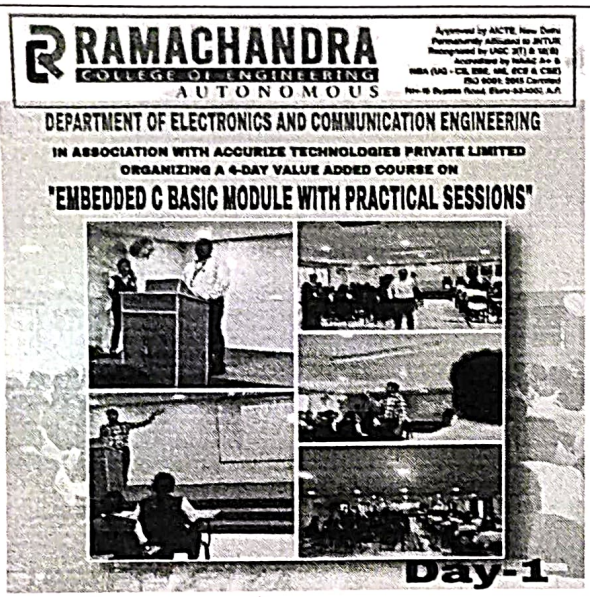
Mr. P. Rajesh acting as a Director for ACCURIZE Technologies Guntur. He is having experience in Industrial needs and current trends.

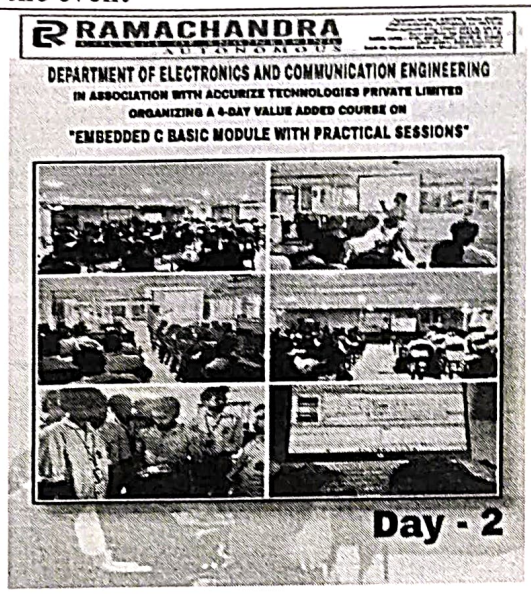
Mr. Y. Kamal Kumar is a dedicated professional with 3 years of experience in the field of embedded systems and hardware prototype development. He has hands-on experience working with microcontrollers, including Raspberry Pi, Arduino, ESP32, and ESP8266, and is skilled in programming languages such as C, Embedded C, and Python.

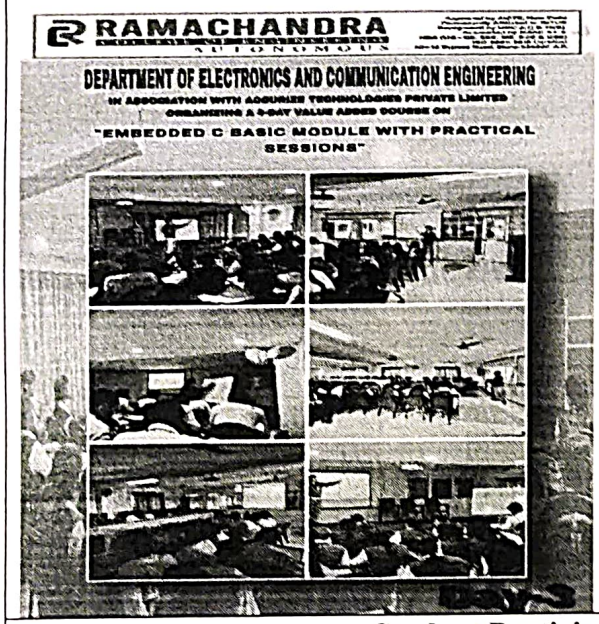
3. Few Glimpses of the Technical Events:

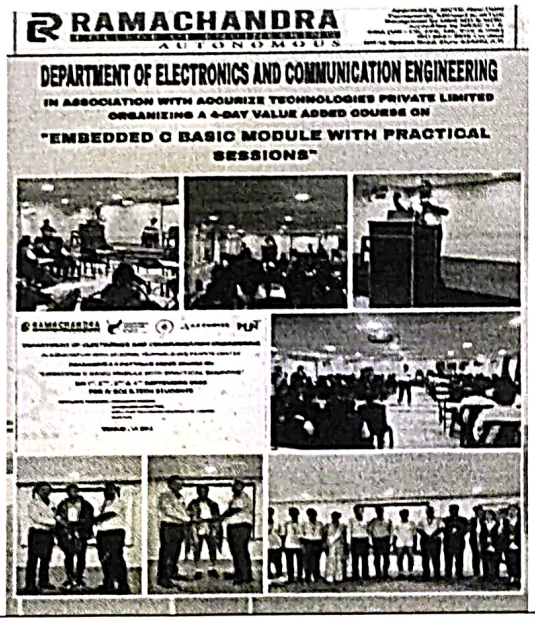


Poster to the event









Student Participants explaining their work

4. Feedback from Participants:

Students from the IV year ECE, RCE, expressed great satisfaction in participating in the value-added course conducted by the Department of ECE, RCE. The course, titled 'Embedded C Programming and Linux System Development,' offered in-depth training on core concepts of embedded systems programming and Linux fundamentals, with a strong industry orientation.

Participants appreciated the hands-on approach, real-world examples, and comprehensive curriculum that covered both Embedded C (including PIC microcontroller applications) and Linux system development. The sessions were highly effective in strengthening their technical foundations and preparing them for core engineering roles. The event organization and hospitality were excellent, and participants noted the enthusiastic support provided by the coordinators, HOD-ECE, Principal, and Management of RCE. They are grateful for the opportunity to take part in such a relevant and career-enhancing co-curricular activity.

.....Student Participants

5. Remarks from Resource Persons:
It is a great pleasure for me to be part of the value-added course conducted by the Department of ECE, RCE. The involvement and support from the faculty members were commendable, and their coordination throughout the program was highly appreciable. The coordinators provided excellent assistance and ensured smooth conduct of the sessions. I sincerely thank the HOD-ECE, Principal, and Management of RCE for providing this valuable opportunity to organize such a well-structured and impactful program. I look forward to more such initiatives in the future. **..... Mr. P. Rajesh**

Coordinator **HoD** **Dean- Academics** **Principal**