Embedded Systems Training Program

Overview
The Embedded Systems Training Program is designed to provide learners with practical knowledge and skills to design, develop, and debug embedded hardware and software. Embedded systems are specialized computing units that perform dedicated functions and are widely used in automotive systems, home appliances, medical devices, industrial machines, and IoT applications.

Objectives
The program focuses on integrating hardware and software into real-time systems. It is ideal for students, electronics engineers, and professionals aiming to build efficient, low-level firmware and embedded applications.

Key Modules

- Basics of embedded hardware: microcontrollers, digital electronics, circuit design
- Working with AVR, PIC, and ARM Cortex-M microcontrollers
- Programming in Embedded C and Assembly
- Using IDEs like Keil, MPLAB, and Arduino IDE
- Interfacing with LEDs, sensors, motors, and displays
- Communication protocols: UART, I2C, SPI,RFID Bluetooth and etc.
- Create cloud with the help of “Things speak”, Blynk, Telegram app

Outcomes

1. Understand embedded system design and microcontroller architecture
2. Write efficient embedded C code
3. Interface hardware with Arduino, ESP32, Raspberry Pi
4. Implement serial communication and real-time control
5. Prepare for careers in Embedded Systems and IoT

Curriculum:

1) Introduction to C.
2) Introduction to Embedded system.
3) Embedded C.
4) Working on Different type of microcontroller such as 8Mega8, Pic microcontrollers.
5) Software and Hardware design.

6)Hardware Interfacing:

Analog to Digital Converter (ADC) interfacing.

Interfacing with sensors (temperature, pressure, light, etc.)

Interfacing with actuators (LEDs, motors, relays)

Serial communication protocols (UART, SPI, I2C)
Wireless Communication Protocols such as Bluetooth,RFID,Wifi….
7)Working on Arduino.
8)Introduction to ESP32,Esp82,RTOS and etc. and create cloud with the help of "Things speak", Blynk, Telegram app
9)Working on raspberry pi
10)Project work.