

VEA

**VinTech
Embedded Academy**



Weekend Embedded Systems Bootcamp

(8 Classes – 1.5 hrs each)

👉 *Start with Embedded basics → then C concepts → then Advanced & Project*

◆ Class 1: Introduction to Embedded Systems

- What is an Embedded System? Examples around us.
 - Core & units present in the core.(Registers also included)
 - How the addition of two numbers performed by core.
 - Microcontrollers vs Microprocessors.
 - Block diagram of a microcontroller.
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◆ Class 2: Embedded Hardware Fundamentals

- Memory types in MCU (Flash, SRAM, EEPROM).
 - Buses (AHB, APB), Clock system, Reset, Power modes.
 - GPIO basics (Input, Output, Toggle).
 - Polling vs Interrupt-driven I/O.
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◆ Class 3: Communication in Embedded Systems

- Introduction to UART, SPI, I2C (with diagrams).
 - How peripherals communicate with CPU.
 - Registers & memory-mapped I/O explained.
 - **Demo:** UART transmit pseudo-code.
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◆ Class 4: C Foundations for Embedded

- What is Embedded C? Difference from normal C.

- Structure of a C program.
 - Data types, sizes & memory representation.
 - Bitwise & shift operations.
 - Macros vs Procedures, Typecasting.
 - **Mini Assignment:** Implement LED toggle logic using macros.
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◆ Class 5: Mastering Pointers & Memory

- Pointers in Embedded (important use cases).
 - Read & write operations using pointers (memory mapped).
 - Function pointers in drivers.
 - Dynamic memory allocation (why it's avoided in embedded).
 - **Demo:** Access a hardware register using pointers.
 - **Mini Assignment:** Write code to reverse an array using pointers.
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◆ Class 6: Structures, Unions & Register Mapping

- Structures & memory allocation.
 - Structure variables and pointers.
 - Unions & memory sharing.
 - Difference between structures and unions.
 - Usage of Structures & unions in Embedded systems
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◆ Class 7: Interrupts & Advanced Concepts

- What are interrupts? Why polling is inefficient.
- ISR basics & volatile.
- Keywords: inline, static, restrict.
- Bare-metal vs RTOS.
- Debugging tools: JTAG, SWD, Watchdog timers.
- **Demo:** Timer interrupt simulation.

- **Mini Assignment:** Implement circular buffer for UART.
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◆ **Class 8: Final Project + Career Roadmap**

Implementing GPIO driver to blink LEDs

 **For Further Information & Enrollment**

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