

# Embedded Systems Design & IoT Applications

## COURSE OVERVIEW

This comprehensive course delivers essential knowledge and practical skills in designing, programming, and deploying embedded systems with a strong focus on IoT applications. It covers microcontroller architectures, real-time operating systems, hardware-software co-design, and IoT communication protocols. Emphasizing resource-constrained environments, real-time performance, and connectivity, participants will gain hands-on experience building embedded solutions integrated with wireless communication and cloud platforms for smart, connected devices.

## WHO SHOULD ATTEND?

This course has been designed for electronics engineers, firmware developers, system architects, and software engineers engaged in embedded and IoT device development. Also suitable for professionals in industrial automation, robotics, AI hardware design, and developers aiming to master microcontroller programming, real-time system design, IoT communication protocols, and cloud integration.

## COURSE OUTCOMES

Delegates will gain the skills and knowledge to:

- Program microcontrollers using C and assembly for embedded applications.
- Design and implement real-time operating system (RTOS) applications.
- Interface with sensors, actuators, and external peripherals.
- Develop, debug, and test embedded software using professional tools.
- Optimize systems for power, performance, and memory constraints.
- Implement IoT communication protocols such as MQTT, CoAP, and Bluetooth Low Energy.
- Integrate embedded systems with cloud platforms for data collection and remote management.

## KEY COURSE HIGHLIGHTS

At the end of the course, you will understand;

- Microcontroller architectures and programming models.
- Real-time operating system fundamentals and practical implementation.
- Peripheral interfacing and device driver development techniques.
- Embedded software debugging, testing, and validation.
- Power management and system optimization methods.
- Hardware-software co-design and integration approaches.
- IoT communication protocols and wireless networking standards.
- Cloud platform integration for IoT data management and analytics.
- Industry standards and safety-critical design considerations.

All our courses are dual-certificate courses. At the end of the training, the delegates will receive two certificates.

1. A GTC end-of-course certificate
2. Continuing Professional Development (CPD) Certificate of completion with earned credits awarded