

STM32 Microcontroller Programming and Applications

Course Description This course provides a comprehensive introduction to STM32 microcontrollers, focusing on hardware architecture, software development, and practical applications. Participants will learn to use STM32CubeMX, HAL libraries, and ARM Cortex features to design, program, and debug embedded systems effectively. The course includes hands-on projects to solidify concepts and develop proficiency in real-world embedded system programming.

Audience Profile

- Engineers and developers seeking to specialize in microcontroller-based systems.
- Students and hobbyists interested in embedded systems programming.
- Professionals transitioning from other microcontroller platforms to STM32.

Prerequisites

- Basic understanding of programming in C.
- Familiarity with electronics and microcontroller fundamentals.
- Knowledge of software development tools and processes.

Course Objectives

- Understand the architecture and features of STM32 microcontrollers.
- Configure STM32 toolchains and software development environments.
- Develop embedded applications using STM32CubeMX and HAL libraries.
- Master peripheral programming, including GPIO, ADC, UART, and PWM.
- Implement interrupt-driven and DMA-based applications.
- Explore real-world projects demonstrating STM32 capabilities.

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- Nucleo-64 Board Options

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- Bare Metal Development
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