



Internship on Embedded System Design Using ARM M0-Cortex Controllers

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| Course Fee | Rs 33,040/- (inclusive of taxes) | Duration | 3 months |
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Summary: This course is designed for those who need to be proficient in 32-bit microcontrollers that are commonly used in communications, tablets, graphic interfaces, handheld devices.

Prerequisites: Basic knowledge of electronics, familiarity with digital logic, hardware design.

Audience: Firmware design engineers who have learnt about 8-bit microcontrollers and have programmed at the register level but have no practical experience in designing using 32 bit Cortex-M0 using CMSIS standards. Use of JTAG devices for debugging and programming in assembly and C will be the focus.

Course Contents

- Introduction to ARM Architecture and NuvotonNumicro ARM-M0 Cortex family
- Introduction to Keil-uVision tools
- Compiling in assembly language and C language
- Basics of assembly language using Thumb architecture of instructions
- Assembly language programming examples
- Debugging assembly language programming using breakpoints, register views
- Introduction to Cortex Microcontroller Software Interface Standard
- Programming in C language
- Interface to seven segment display
- Interface to LCD, LEDs, buzzers and switches
- Interface to ADCs
- PWM generation for power electronic controls
- RTOS in ARM Controllers
- Real time Projects using Cortex M0 controllers in power electronics, communications and control systems

Programming examples in assembly language will be provided to demonstrate the capability of arithmetic and logical data processing capabilities at the register level. JTAG devices will be used for probing the ARM Cortex at the register level to understand the basics of assembly level programming. Programming examples in C language will be provided to demonstrate the capability of ARM-M0-Cortex family using the Nuvoton series of controllers. The various peripherals will be experienced with examples and students will be asked to program the ARM boards for control and instrumentation applications. Projects in the field of power electronics, communications and control will be guided with respect to product development experience suitable for industry.

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