



Cortex-M85 Hardware Development

Course Description

Cortex-M85 Hardware development is a 4 days ARM official course. The course goes into great depth and provides all necessary know-how to develop hardware for systems based on Cortex-M85 processor.

The course covers the Cortex-M85 architecture (Armv8.1-M), processor core, processor bus interfaces and what should be connected to, programmer's model, instruction set overview, NVIC & exception handling, memory model, caches management, memory protection unit (MPU), MVE & floating point, external coprocessors, RAS extension for functional safety, power management, debug & trace, and security.

In addition, the Arm Corstone-310 is also covered to show how to connect the Cortex-M85 and the Ethos-U55 uNPU.

At the end of the course the participant will receive a certificate from ARM.

Course Duration

4 days

Goals

1. Become familiar with ARMv8.1-M architecture
2. Become familiar with Cortex-M85 architecture
3. Become familiar with ARMv8.1-M instruction set
4. Be able to handle interrupts and various exceptions with NVIC, IWIC, and EWIC
5. Be able to configure and use the MPU
6. Understand the memory model in v8.1-M architecture
7. Manage caches
8. Add an external coprocessors to accelerate performance
9. Be able to connect debug components to your SoC
10. Become familiar with DSP and FP instructions
11. Efficiently partition your Core into separate power domains with Q and P channels
12. Design a secured system with TrustZone for ARMv8-M
13. Use the MVE engine to enhance performance with vectorization
14. Connect Ethos-U55 uNPU

Target Audience

Hardware engineers that would like developing SoC based on Cortex-M85 microcontroller.

Prerequisites

- Computer architecture background
- Verilog
- Experience in developing embedded systems

Course Material

- ARM official course book
- Labs handbook

Agenda

Main Topics:

- Cortex-M85 Overview
- ARMv8-M Mainline Programmer's Model
- Cortex-M85 Processor Core "Deep Dive" (including all bus interfaces)
- ARMv8-M Mainline ISA Overview
- ARMv8-M Mainline Exception Handling
- ARMv8-M Mainline Memory Model
- Armv8-M Mainline Memory Protection
- Armv8-M Power Management
- Armv8-M External Coprocessors
- ARMv8-M Synchronization
- ARMv8-M Mainline Debug & Trace
- ARMv8-M Mainline DSP Extension
- ARMv8-M Mainline Floating-Point Extension
- ARMV8.1-M PMU (Performance Monitoring Unit)
- ARMV8.1-M Mainline Security Extension
- ARMv8.1-M MVE (M-Profile Vector Extension)
- ARMv8.1-M RAS extension for functional safety
- Arm Corstone-310



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