



Cortex-R52+ Software Development

Course Description

Cortex-R52+ builds on its predecessor, the Arm Cortex-R52, to assist integration and virtualization for functional safety applications, while maintaining software compatibility.

Cortex-R52+ software development is a 3-days ARM official course. The course goes into great depth and provides all necessary know-how to develop software for systems based on Cortex-R52+ processor.

The course covers the ARMv8-R architecture, processor architecture, memory ordering, memory protection unit (MPU), caches and TCMS, safety, Assembler language, synchronization, barriers, virtualization, debug, boot, GIC, C for ARM and exception handling.

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

Course Duration

3 days (4 with Hands-on labs)

Goals

1. Become familiar with ARMv8-R architecture
2. Become familiar with Cortex-R52+ architecture
3. Become familiar with ARM A32/T32 instruction sets
4. Handle interrupts and other exception types
5. Apply safety features
6. Understand Caches and TCMs structures and maintenance
7. Be able to understand assembler code for Cortex-R52+
8. Implement synchronization processes using mutex/semaphore
9. Be able to add barriers instructions to control program flow
10. Be able to configure and use the MPU
11. Apply invasive and non-invasive debug techniques
12. Write an efficient C code for Cortex-R52+ processor
13. Program the GIC
14. Understand the boot process for single and multi-cores

Target Audience

Software engineers that would like developing software and BSP for platforms based on Cortex-R52+ processor.

Prerequisites

- Computer architecture background
- C and Assembler
- Experience in developing embedded systems

Course Material

ARM official course book

Agenda

Main Topics:

- Introduction to the ARMv8-R
- Assembler Programming for Cortex-R52+
- Exception Handling
- Software Engineer's Guide to the Cortex-R52+
- ARM Caches and TCMs
- Using the MPU
- Synchronization
- Barriers
- Writing C for ARM
- Programming the GIC
- Cortex-R52+ Booting
- Virtualization in ARMv8-R
- Debug
- Introduction to safety package