

The essentials of embedded design for Xilinx Zynq™-7000 & Zynq MPSoC components

4 days - 28 hours

OBJECTIVES

- After completing this comprehensive training, you will have the necessary skills to:
 - Describe the architecture and embedded components of Xilinx
 - Relate a user design goal to the function, benefit, and use of the Zynq All Programmable SoC
 - Effectively select and design an interface between the Zynq PS and programmable logic (PL) that meets project goals
 - Analyze the tradeoffs and advantages of performing a function in software versus PL
 - Describe the various tools that encompass a Xilinx embedded design
 - Rapidly architect an embedded system containing a MicroBlaze or Cortex-A9 processor using the Vivado IP integrator and Customization Wizard
 - Create and integrate an IP-based processing system component in the Vivado Design Suite
 - Design and add a custom AXI interface-based peripheral to the embedded processing system
 - Implement an effective software design environment for a Xilinx embedded system using the Xilinx SDK tools
 - Write a basic user application (under Standalone or Linux) using the Xilinx Software Development Kit (SDK) and run it on an embedded system platform
 - Use Xilinx debugger tools to troubleshoot user applications
 - Apply software techniques to improve operability
 - Maintain and update software projects with changing hardware

RELATED TRAININGS

- Zynq UltraScale+™ MPSoC : System Architecture
- Zynq UltraScale+™ MPSoC : Hardware and Software Design

PREREQUISITES

- Digital system architecture design experience
- Basic understanding of microprocessor and FPGA architecture
- Basic understanding of C programming
- Basic HDL modeling experience

PARTNERS



CONFIGURATIONS

- Software Configuration :
 - Xilinx Vivado™ Design or System Edition 2019.1
- Hardware configuration:
 - Recent computer (i5 or i7)
 - Windows 7 64b or Ubuntu 16.04 LTS
 - At least 8GB RAM
 - Minimum display resolution 1024 x 768, recommended 1920x1080

CHAPTERS

DAY 1

- Embedded UltraFast Design Methodology
- Zynq-7000 SoC Architecture Overview
- Zynq UltraScale+ MPSoC Architecture Overview
- MicroBlaze Processor Architecture Overview
- Overview of Embedded Hardware Development
- Driving the IP Integrator tool {Lab}
- Overview of Embedded Software Development
- Driving the SDK Tool {Lab}
- System Debugger {Lab}

DAY 2

- Inside the Application Processor Unit (APU) {Lab}
- Processor Input/Output Peripherals
- Introduction to AXI
- Zynq AP SoC PS/PL AXI Interfaces {Lab}
- AXI: Connecting AXI IP
- Standalone Software Platform Development {Lab}
- Memory File System (Standalone)

DAY 3

- Introduction to Interrupts
- Interrupts: Software Considerations {Lab}
- Zynq Memory Resources
- DMA
 - Introduction and Features
 - Block Design and Interrupts
 - Read and Write
- Meeting Your Performance Goals
- Using Linker Scripts {Lab}
- Debugging the Zynq {Lab}

DAY 4

- Zynq booting {Lab}
- Using the Create and Import Wizard to Create a New AXI IP {Lab}
- AXI BFM Simulation Using Verification {Lab}
- Understanding Device Drivers
- Custom Device Drivers {Lab}
- Operating Systems: Introduction and Concepts
- Linux: A High-Level Introduction
- Linux Software Application Development Overview {Lab}

TEACHING METHODS

- Classroom training:
 - Face to face
 - Presentation by video projector
 - Provision of PDF course materials
- Virtual training:

- Onlive training
- Presentation by Webex
- Provision of PDF course materials

SUPPORT

- Authorized Trainer Provider XILINX : Engineer Electronics and Telecommunications ENSIL
 - Expert FPGA XILINX - Language VHDL/Verilog - RTL Design
 - Expert SoC & MPSoC XILINX - Language C/C++ - System Design
 - Expert DSP & RFSoc XILINX – HLS - Matlab - Design DSP RF
 - Expert ACAP XILINX – AI Engines – Heterogenous System Architect

METHODS OF MONITORING AND ASSESSMENT OF RESULTS

- Attendance sheet
- Evaluation questionnaire
- Evaluation sheet on:
 - Technical questionnaire
 - Result of the Practical Works
 - Validation of Objectives
- Presentation of a certificate with assessment of prior learning

CONCERNED PUBLIC

- Technicians and Engineers in Digital Electronics

CONTACT

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