

# Designing with the Adaptive SoC Versal™ : Architecture and Methodology

## COURSE DURATION



4 days - 28 hours

## TARGET OBJECTIVES AND SKILLS

- 1 - Describe the architecture of Versal at a high level.
- 2 - Describe the different engines of the Versal device
- 3 - Use the different blocks of the Versal architecture to create complex systems
- 4 - Identify the programming interfaces and describe the boot and security functions
- 5 - Know and build compatible software stacks in the Versal
- 6 - Perform system level simulation and debugging
- 7 - Identify the main components of the NoC and configure the QoS in Versal
- 8 - Describe the debugging facilities, GT links, PCIe block
- 9 - Identify and apply different design methodologies

## CONCERNED PUBLIC

- Technicians and Engineers in Digital Electronics
- All our training courses are given at a distance and are accessible to people with reduced mobility.
- People with disabilities may have special training needs. Our partner AGEFIPH accompanies us to implement the necessary adaptations related to your disability. Don't hesitate to discuss your requirements.



## PREREQUISITES

- Comfort with the C/C++ programming language
- Vitis™ IDE software development flow
- Hardware development flow with the Vivado® Design Suite
- Basic knowledge of UltraScale™/UltraScale+™ FPGAs and Zynq™ UltraScale+ MPSoCs

## NOTES

- Release date: 15/11/2024

## COURSE CONTENT

### DAY 1

- Objective 1
  - Architecture Overview {Lecture}
- Objective 2
  - Processing System {Lecture}
  - Adaptable Engines (PL) {Lecture}
  - DSP Engine {Lecture}
  - AI Engine {Lecture}
  - NoC Introduction and Concepts {Lecture, Lab}
  - Design Tool Flow {Lecture, Lab}

### DAY 2

- Objective 3
  - SelectIO Resources {Lecture}
  - Clocking Architecture {Lecture}
  - Timers, Counters, and RTC {Lecture}
  - System Interrupts {Lecture}
  - Device Memory {Lecture}
- Objective 4
  - Programming Interfaces {Lecture}
  - PMC and Boot and Configuration {Lecture, Lab}
  - Security Features {Lecture}
- Objective 5
  - Software Stack {Lecture}

- Software Build Flow {Lecture, Lab}

### DAY 3

- Objective 6
  - Application Partitioning {Lecture}
  - System Simulation {Lecture, Lab}
- Objective 7
  - NoC Architecture {Lecture}
  - NoC DDR Memory Controller {Lecture}
  - NoC Performance Tuning {Lecture, Lab}
- Objective 8
  - Debugging {Lecture}
  - Fabric Debug {Lecture, Lab}
  - Hard Block Debug {Lecture}



### DAY 4

- Objective 8
  - Serial Transceivers {Lecture}
  - PCI Express & CCIX {Lecture}
- Objective 9
  - Comparison with UltraScale Devices {Lecture}
  - System Design Migration {Lecture}
  - Power & Thermal Solutions {Lecture, Lab}
  - System and Solution Planning Methodology {Lecture}
  - Hardware, IP, and Platform Development Methodology {Lecture, Lab}
  - System Integration and Validation Methodology {Lecture}

## TEACHING METHODS AND SUPPORT - ASSESSMENT & RECOGNITION

- **Teaching methods :**
  - Alternating lectures, technical questionnaires and exercises on individual machines.
- **Pedagogical follow-up :**
  - Signed attendance sheet
- **Pedagogical assessment :**
  - Continuous assessment and progress sheet :
    - Technical questionnaire
    - Practical work results
    - Validation of objectives
- **Satisfaction survey :**
  - At the end of training: assessment form completed by the trainee
  - At 3 months: evaluation form completed by the trainee after application to the company
- **Certificate :**
  - Training certificate with assessment of learning provided to trainee
  - Certificate of completion provided to employer

## TEACHING METHODS

- **Inter-company online training :**
  - Fast Internet connection, webcam, headset
  - Presentation by Webex by Cisco  

  - Provision of course material in PDF format
  - Labs on individual Cloud PC by RealVNC  

- **Intra-company face-to-face training on customer site : (details to be confirmed prior to training)**
  - Suggested supply by the customer :
    - Training room
    - Video projector
    - Whiteboard
    - Individual PC with AMD tools
  - Provided by MVD Training :
    - Course material in PDF format
    - Practical work on individual PCs (loan of equipment available on request)

## RECOMMENDED COMPUTER HARDWARE

- **Inter-company online training :**
  - Recent computer OS Linux or Windows 64-bits
  - Fast Internet, webcam, headset
  - Software tool WebEx Cisco
  - **AMD remote tools :**
    - Software tool RealVNC Viewer
  - **AMD local tools :**
    - Software tool AMD Vitis 2024.1
- **Face-to-face training on customer site :**
  - Recent computer OS Linux or Windows 64-bits
  - Software tool AMD Vitis 2024.1

## TEACHING STAFF

- **William Duluc, Electronics and Telecoms Engineer, AMD Expert since 2009 and AMD Trainer since 2017 :**
  - Expert AMD FPGA - Language VHDL/Verilog - RTL Design
  - Expert AMD SoC & MPSoC - Language C/C++ - System Design
  - Expert DSP & AMD RFSoc - HLS - Matlab - Design DSP RF
  - Expert AMD Versal - AI Engines - Heterogenous System Architect

## TECHNICAL, EDUCATIONAL, ADMINISTRATIVE AND FINANCIAL CONTACT

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