

# Designing Xilinx Zynq-Based Systems using SDSoC

SDx 2018.2



# Course Objectives

- > **After completing this course, you will be able to:**
  - >> Introduce the concept of “software-defined” systems on chip (SDSoC)
  - >> Understand the capabilities and limitations of the SDSoC development environment
  - >> Get hands-on experience of creating application-specific systems on chip from C/C++ programs using the SDSoC
  - >> Gain practical understanding of the SDSoC design flow
    - How the SDSoC compiler maps programs to HW/SW systems
      - Structure of generated hardware systems
      - Structure of the generated software
    - How to control the compilation and generation process
      - Modifying program source using #pragmas
  - >> Identify the architectural aspects of an SoC that facilitate hardware acceleration

# Course Objectives (2)

- >> Identify candidate functions for hardware acceleration
- >> Move designated software functions to hardware and estimate the performance of the accelerator and the effect on the entire system
- >> Use the System Debugger's capabilities to control the execution flow and examine memory and variables during a debug session
- >> Create a hardware platform for an custom application

# Course Outline

## Day 1

**The course consists of the following modules:**

- > Zynq AP SoC architecture and Vivado IPI**
- > SDSoC tool overview**
- > Lab 1: Getting started with SDSoC design flow**
- > Data motion networks**
- > Lab 2: Pragma and data motion networks**
- > Coding Considerations**
- > Profiling**
- > Lab 3: Profiling application and create accelerators**

# Course Outline

## Day 2

- > **Estimation**
- > **Lab 4: Estimating accelerator performance**
- > **Debugging**
- > **Lab 5: Debugging software application**
- > **Using C-callable libraries and creating multiple accelerators**
- > **Improving performance with Vivado HLS**
- > **Lab 6: Fine-tuning with Vivado HLS**
- > **Creating SDSoC platform**
- > **Lab 7: Creating and using platform for an custom application**

# Prerequisites

- > **Basic C programming**
- > **Basic understanding of processor-based system**

# Platform Support

- > **SDx Suite 2018.2**
- > **Xilinx University board**
  - >> PYNQ-Z1 and PYNQ-Z2
- > **Supported Operating Systems**
  - >> Windows 7 and 7 SP1 Professional (64 Bit)
  - >> Windows 10 Professional versions 1709 and 1803 (64 Bit)
  - >> Red Hat Enterprise Workstation Linux 6.7 – 6.8 (64 Bit)
  - >> Red Hat Enterprise Workstation/Server Linux 7.3-7.4 (64 Bit)
  - >> CentOS 7.2 (64 Bit)
  - >> Ubuntu Linux 16.04.3 LTS (64 Bit)

**Adaptable.**  
**Intelligent.**

