

# Software-Defined Radio with Zynq using Simulink

## Prerequisites

*Programming Xilinx Zynq SoCs with MATLAB and Simulink.* Knowledge of concepts of communications and hardware design.

Day 1 of 1	
<b>Model Communications System using Simulink</b>	<p><b>Objective:</b> Model and simulate RF signal chain and communications algorithms.</p> <p>Overview of software-defined radio concepts and workflows</p> <p>Model and understand AD9361 RF Agile Transceiver using Simulink</p> <p>Simulate a communications system that includes a transmitter, AD9361 Transceiver, channel and Receiver (RF test environment)</p>
<b>Implement Radio I/O with ADI RF SOM and Simulink</b>	<p><b>Objective:</b> Verify the operation of baseband transceiver algorithm using real data streamed from the AD9361 into MATLAB and Simulink.</p> <p>Overview of System object and hardware platform</p> <p>Set up ADI RF SOM as RF front-end for over-the-air signal capture or transmission</p> <p>Perform baseband processing in MATLAB and Simulink on captured receive signal</p> <p>Configure AD9361 registers and filters via System object</p> <p>Verify algorithm performance for real data versus simulated data</p>
<b>Prototype Deployment with Real-Time Data via HW/SW Co-Design</b>	<p><b>Objective:</b> Generate HDL and C code targeting the programmable logic (PL) and processing system (PS) on the Zynq SoC to implement TX/RX.</p> <p>Overview of Zynq HW/SW co-design workflow</p> <p>Implement Transmitter and Receiver on PL/PS using HW/SW co-design workflow</p> <p>Configure software interface model</p> <p>Download generated code to the ARM processor and tune system parameters in real-time operation via Simulink</p> <p>Deploy a stand-alone system</p>