

Simulink for Analog Mixed-Signal Design

OEM: MathWorks • Duration: 2 Days (16 hrs) • Code: MW-SIMULINK-FOR-ANALOG-MIXED-SIGNAL-DESI

COURSE MODULES & TOPICS

Day 1 of 2

Creating and Simulating a Model

- Creating and editing a Simulink model
- Defining system inputs and outputs
- Simulating models and analyzing results

Modeling Discrete Dynamic Systems

- Modeling a discrete system with basic blocks
- Finding sample times of block outputs
- Using frames in your model
- Using buffers
- Viewing frame-based signals
- Behavior of delay blocks with frame-based signals
- Using the discrete filter block
- Designing analog and decimation/interpolation filters

Modeling Logical Constructs

- Modeling logical expressions
- Modeling conditional signal routing
- Understanding zero-crossing detection
- Modeling with the MATLAB Function block

Mixed-Signal Models

- What is a mixed-signal model?
- Modeling an ADC with aperture jitter and nonlinearity
- Case study: Modeling TI's ADS62P29 ADC
- Modeling a PLL with phase noise and other impairments
- Using blocks from the Mixed-Signal Blockset

Day 2 of 2

Simulink Solvers

- Understanding the Simulink solver
- Solving simple models
- Solving models with discrete and continuous states
- Solving models with multiple rates
- Fixed-step and variable-step solvers
- Choosing a continuous-state system solver
- Handling zero crossings
- Handling algebraic loops
- Case study: Solver profiler for PLL simulation

Subsystems and Libraries

- Creating subsystems
- Understanding virtual and atomic subsystems
- Modeling condition-driven systems with enabled subsystems
- Modeling condition-driven systems with triggered subsystems
- Using a subsystem as a model component
- Masking subsystems
- Creating custom block libraries
- Working with and modifying library blocks
- Adding custom libraries to the Simulink Library Browser
- Creating configurable subsystems

Testbenches and Measurements

- Performing spectral analysis with the Spectrum Scope block
- Choosing spectral analysis parameters
- Using the logic analyzer
- Measuring Phase Noise, INL, DNL, Jitter
- Using testbenches from the Mixed Signal Blockset

Control Design Analysis

- Creating and analyzing bode plots
- Performing Linearization
- Using the Control System Designer
- Automating test runs
- Checking and modifying parameter settings
- Finding blocks with specific parameter values
- Constructing and modifying block diagrams