

Modeling Physical Systems with Simscape

Training Objectives

This course focuses on modeling systems in several physical domains and combine them into a multidomain system in the Simulink® environment using Simscape™. Topics include:

- Creating models in various physical domains, such as electrical, mechanical, and hydraulic
- Interpreting Simscape diagrams
- Combining Simulink models and Simscape models
- Modeling energy transfer between different physical domains
- Creating user-defined Simscape components

Prerequisites

MATLAB Fundamentals and *Simulink Fundamentals*

Products

- Simulink
- Simscape

Course Outline

Day 1 of 1

Introduction to Simscape and the Physical Network Approach (1.0 hrs)

Objective: Become familiar with the Simscape environment by modeling a simple electrical system.

- Introduction to Simscape
- Differences between Simulink and Simscape
- Building and simulating a model in Simscape
- Guidelines for Simscape modeling

Working with Simscape Components (2.0 hrs)

Objective: Interpret Simscape block diagrams and identify the physical variables in Simscape by modeling a mechanical system.

- Describing Simscape component fundamentals
- Using the Simscape Foundation Library
- Setting initial conditions
- Logging physical variables

Connecting Physical Domains (1.0 hrs)

Objective: Connect models from different physical domains to create a single, multidomain model.

- Creating multidomain physical components
- Modeling ideal and nonideal connections between physical domains
- Dividing components into subsystems
- Parameterizing models

Combining Simscape Models and Simulink Models (1.0 hrs)

Objective: Add Simulink blocks to a Simscape model to increase modeling flexibility.

- Connecting physical signals and Simulink signals
- Performing operations on physical signals
- Controlling physical models
- Solving models with Simscape and Simulink blocks

Creating Custom Components with the Simscape Language (2.0 hrs)

Objective: Leverage the Simscape language to create custom physical components in Simscape.

- Simscape language
- Custom component workflow
- Complete custom component example