



Modeling Driveline Systems with Simscape



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Modeling Driveline Systems with Simscape

This one-day course focuses on modeling mechanical systems for automotive applications in the Simulink environment using Simscape Driveline. Topics include: modeling vehicle bodies and tires, designing and optimizing braking systems, building and testing mechanical power transmission mechanisms and creating multidomain automotive models with closed-loop controllers.

Prerequisites

MATLAB Fundamentals, Simulink Fundamentals, and Modeling Physical Systems with Simscape

DURATION	LEVEL
1 day	Medium
	

TOPICS

Day 1

- Introduction to Vehicle Modeling
- Braking Systems
- Transmission Mechanisms
- Multidomain Drive and Control

Introduction to Vehicle Modeling

OBJECTIVE: Create and analyze vehicle body and tire models under various terrain, wind, and friction conditions.

- Vehicle body modeling
- Friction, wind, and terrain effects
- Sensing physical quantities
- Dividing model and measurements

Braking Systems

OBJECTIVE: Model vehicle braking systems with built-in blocks and custom Simscape language components.

- Simscape Driveline brake blocks
- Measuring wheel quantities
- Custom brake model

Transmission Mechanisms

OBJECTIVE: Build and test mechanical power transmission systems in Simscape Driveline.

- Actuating models with power sources
- Building driveline mechanisms
- Creating a multispeed transmission

Multidomain Drive and Control

OBJECTIVE: Connect mechanical automotive models to other physical domains in Simscape and create realistic closed-loop control strategies.

- DC motor drive
- PWM actuation
- Closed-loop speed control



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