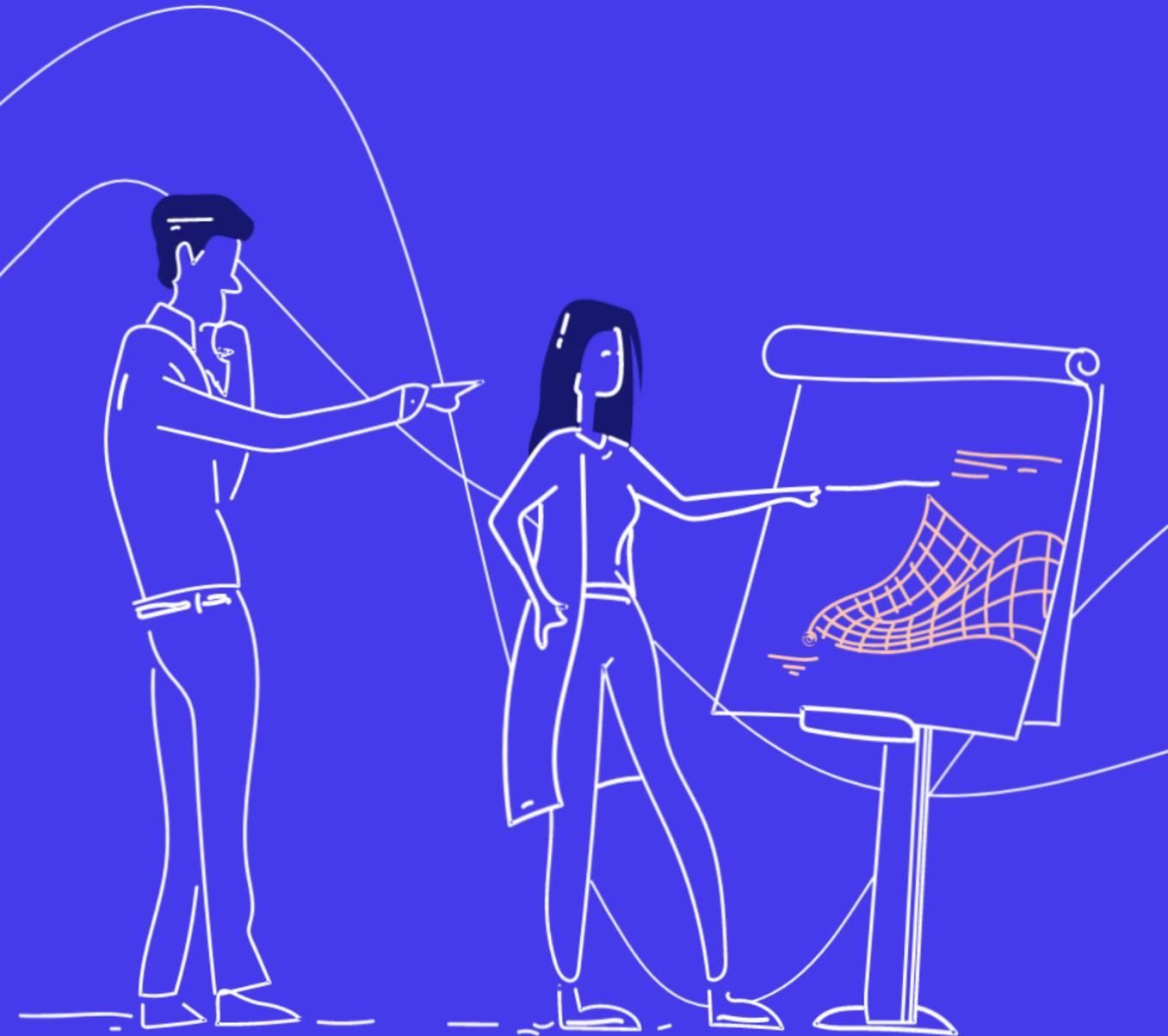




Modeling Multibody Mechanical Systems with Simscape



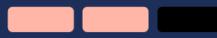
SciEngineer's training courses are designed to help organizations and individuals close skills gaps, keep up-to-date with the industry-accepted best practices and achieve the greatest value from MathWorks® and COMSOL® Products.

Modeling Multibody Mechanical Systems with Simscape

This one-day course focuses on how to model rigid-body mechanical systems in the Simulink environment using Simscape Multibody. Topics include: modeling simple multibody systems, creating reusable models of mechanical systems, importing models from CAD software and combining Simulink, Simscape and Simscape Multibody blocks.

Prerequisites

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

DURATION	LEVEL
1 day	Medium
	

TOPICS

Day 1

- Introduction to Multibody Simulation
- Refining Components
- Assembling Mechanisms
- Importing CAD Models
- Connecting to Simscape and Simulink

Introduction to Multibody Simulation

OBJECTIVE: Discuss the components that make up mechanical models and how to define them in Simscape Multibody.

- Terminology
- Solids
- Coordinate frames
- Joints
- Visualization

Refining Components

OBJECTIVE: Create custom and complex rigid bodies, and parameterize parts for reusable Simscape Multibody models.

- Defining geometries
- Creating compound bodies
- Specifying body interfaces
- Parameterizing bodies for reuse

Assembling Mechanisms

OBJECTIVE: Define and configure kinematics of a multibody machine in Simscape Multibody.

- Reusing existing components
- Specifying degrees of freedom
- Sensing and logging simulation results
- Adding stiffness and damping to joints
- Setting initial conditions
- Guiding and verifying an assembled mechanism

Importing CAD Models

OBJECTIVE: Import existing parts and mechanisms from CAD platforms into Simscape Multibody.

- Visualizing bodies with CAD geometries
- Identifying the different CAD import workflows
- Exporting from CAD software
- Importing into Simscape Multibody
- Features captured by Simscape Multibody Link

Connecting to Simscape and Simulink

OBJECTIVE: Illustrate the ways that Simscape Multibody blocks can interact with Simscape and Simulink blocks.

- Adding a combustion model using Simscape
- Actuating the piston head
- Sensing constraint forces on joints
- Adding a control system for throttle
- Creating a multidomain physical model



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knowledge**

