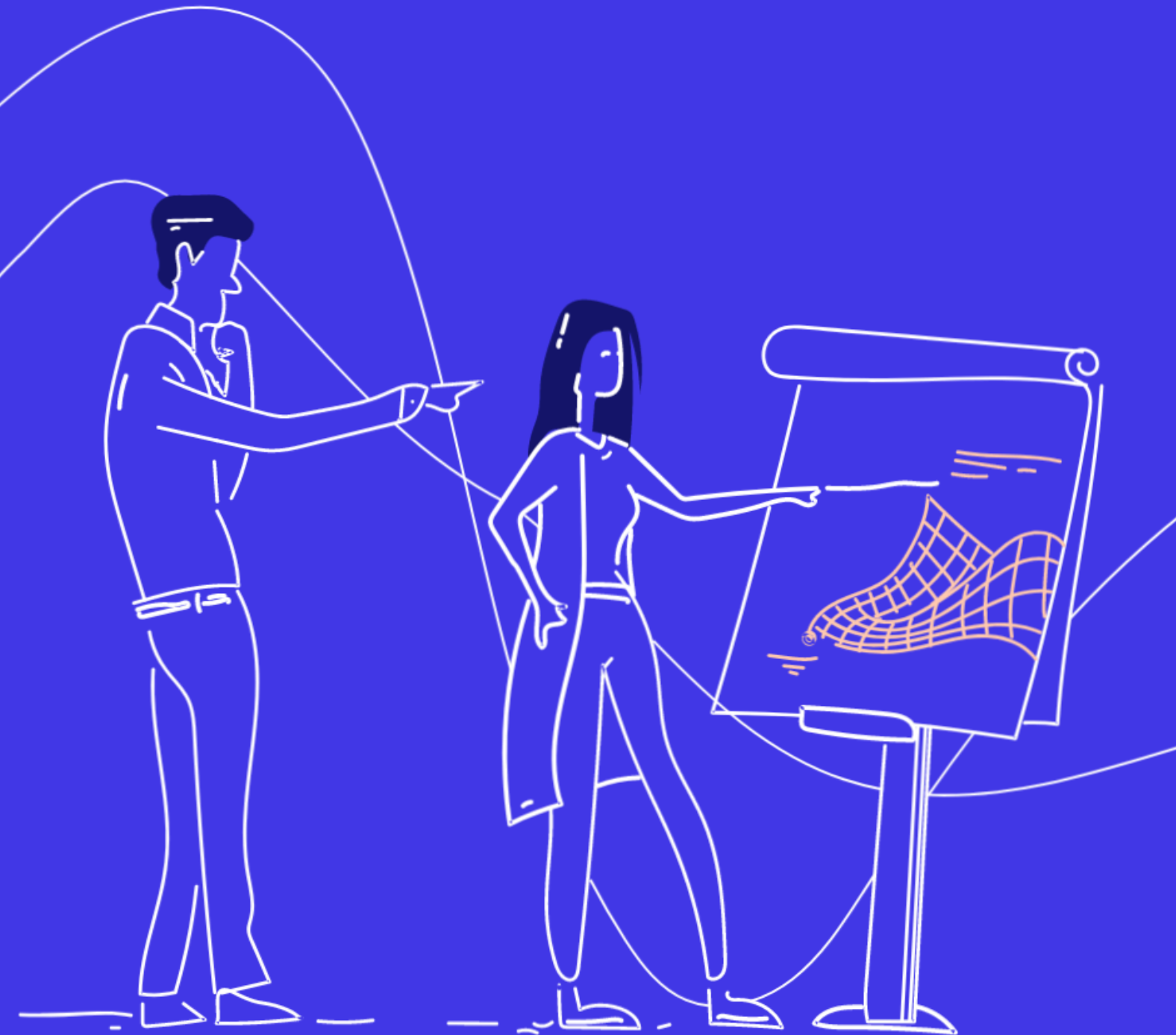




Motor Control with Simulink and Simscape



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.

Motor Control with Simulink and Simscape

This one-day course describes techniques for the modeling, controls, and validation of electric motor drives using Simulink®, Simscape Electrical™, and Motor Control Blockset™.

Prerequisites

- MATLAB Fundamentals and Simulink Fundamentals. This course is intended for intermediate or advanced Simulink users.

DURATION	LEVEL
1 Day	Intermediate
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TOPICS

Day 1

- Electric Machine Operating Principles
- Overview of the AUTOSAR Adaptive Platform
- Three-Phase Brushless Motors
- Field-Oriented Control
- Variable-Speed Drives

Electric Machine Operating Principles

OBJECTIVE: Introduce electromechanical energy conversion principles and their applications towards electric machines.

- Overview of electric motors
- Electric machine operating principles
- Clarke and Park transform
- Motor control development workflow

Three-Phase Brushless Motors

OBJECTIVE: Model three-phase brushless motors using lumped parameter and high-fidelity models. Simulate the motor drive and examine the motor behaviour under different operating conditions.

- Three-phase brushless motor
- Tabulated motor model data
- Three-phase inverter
- Pulse-width modulation implementation
- Open-loop voltage control

Field-Oriented Control

OBJECTIVE: Implement current control for a three-phase brushless motor using field-oriented control. Tune the controller and validate the controller performance.

- Field-oriented control (FOC)
- Current control implementation
- Controller tuning

Variable-Speed Drives

OBJECTIVE: Implement a variable-speed drive by considering the motor performance under different operating regions. Extend the operation of the motor to high speeds using field-weakening control.

- Maximum-torque-per-ampere
- Field weakening
- Torque speed characteristics
- Speed control



Expand your knowledge

