



## Course Title:

### **Power Electronics Control Design with Simulink and Simscape**

## Course Purpose:

This one-day course focuses on modeling and controlling power electronic systems in the Simulink® environment using Simscape Electrical™. Topics include:

- Modeling direct current (dc) power electronic components
- Controlling the level of fidelity in a model
- Developing controls for power electronics
- Modeling three-phase alternating current (ac) power electronic components
- Controlling power electronics for motor drive applications

## Pre- requisites:

*MATLAB Fundamentals, Simulink for System and Algorithm Modeling, and Modeling Physical Systems with Simscape*



- ✓ 1 training day
- ✓ Hours: 09:00-17:00
- ✓ Total training hours: 8

## Teaching method

The course combines lectures, demonstrations and practical exercises in MATLAB, using original training books from MathWorks. The course is in Hebrew but the training materials are in English.

## Course Objective:

### DC Power Electronic Systems

**Objective:** Learn to model and analyze direct current (dc) power electronic systems.

- Modeling a boost converter
- Measuring physical quantities
- Visualizing results
- Selecting a solver

עמוד מס' 1

### **Training Center Systematics - Contact information:**

**Phone number:** 03-7660111 Ext: 6 **Email:** [training@systematics.co.il](mailto:training@systematics.co.il)

**Website:** <http://www.systematics.co.il/mathworks>



### Converter Model Fidelity

**Objective:** Learn to build power electronic models using the most appropriate level of fidelity.

- Selecting appropriate converter model fidelity
- Using prebuilt components
- Logging and comparing signals
- Measuring efficiency and losses

### Linearization and Control

**Objective:** Learn to linearize power electronic switching models and tune closed-loop control systems.

- Implementing closed-loop voltage control
- Linearizing power electronic converters
- Tuning the controller

### Three-Phase Power Electronic Systems

**Objective:** Learn to model and analyze three-phase ac power electronic systems.

- Modeling a three-phase inverter
- Measuring three-phase physical quantities
- Characterizing harmonics and distortion

### Motor Control

**Objective:** Learn to model and control electric motors using power electronics.

- Modeling a PMSM motor
- Implementing motor control
- Verifying the motor design
- Integrating into a system-level model

עמוד מס' 2

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