



Course Title:

Simulink for System and algorithm Modeling

Course Purpose

This two-day course is for engineers who are new to system and algorithm modeling and design validation in Simulink. It demonstrates how to apply basic modeling techniques and tools to develop Simulink block diagrams.

Topics include:

- Creating and modifying Simulink models and simulating system dynamics
- Modeling continuous-time, discrete-time, and hybrid systems
- Modifying solver settings for simulation accuracy and speed
- Building hierarchy into a Simulink model
- Creating reusable model components using subsystems, libraries, and model references

Pre- requisites

MATLAB Fundamentals course or equivalent experience using MATLAB.



- ✓ 2 training days
- ✓ Hours: 09:00-17:00
- ✓ Total training hours: 16

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.

עמוד מס' 1

Training Center Systematics - Contact information:

Phone number: 03-7660111 Ext: 5 **Email:** training@systematics.co.il

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



Course Objective:

Creating and Simulating a Model

Objective: Create a simple Simulink model, simulate it, and analyze the results.

- Define the potentiometer system
- Explore the Simulink environment interface
- Create a Simulink model of the potentiometer system
- Simulate the model and analyze results

Modeling Programming Constructs

Objective: Model and simulate basic programming constructs in Simulink.

- Comparisons and decision statements
- Zero crossings
- MATLAB Function block

Modeling Discrete Systems

Objective: Model and simulate discrete systems in Simulink.

- Define discrete states
- Create a model of a PI controller
- Model discrete transfer functions and state space systems
- Model multirate discrete systems

Modeling Continuous Systems

Objective: Model and simulate continuous systems in Simulink.

- Create a model of a throttle system
- Define continuous states
- Run simulations and analyze results
- Model impact dynamics

Solver Selection

Objective: Select a solver that is appropriate for a given Simulink model.

- Solver behavior
- System dynamics
- Discontinuities
- Algebraic loops

עמוד מס' 2

Training Center Systematics - Contact information:

Phone number: 03-7660111 Ext: 5 **Email:** training@systematics.co.il

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



Developing Model Hierarchy

Objective: Use subsystems to combine smaller systems into larger systems.

- Subsystems
- Bus signals
- Masks

Modeling Conditionally Executed Algorithms

Objective: Create subsystems that are executed based on a control signal input.

- Enabled subsystems
- Triggered subsystems
- Input validation model

Combining Models into Diagrams

Objective: Use model referencing to combine models.

- Model referencing and subsystems
- Model referencing workflow
- Set up a model reference
- Model reference simulation modes
- Store parameters in referenced models

Creating Libraries

Objective: Use libraries to create and distribute custom blocks.

- Create and populate libraries
- Manage library links
- Add a library to the Simulink Library Browser

עמוד מס' 3

Training Center Systematics - Contact information:

Phone number: 03-7660111 Ext: 5 **Email:** training@systematics.co.il

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