



Course Title:

Machine Learning with MATLAB

Course Purpose

This two-day course focuses on data analytics and machine learning techniques in MATLAB using functionality within Statistics and Machine Learning Toolbox and Neural Network Toolbox™. The course demonstrates the use of unsupervised learning to discover features in large data sets and supervised learning to build predictive models. Examples and exercises highlight techniques for visualization and evaluation of results. Topics include:

- ✓ Organizing and preprocessing data
- ✓ Clustering data
- ✓ Creating classification models
- ✓ Interpreting and evaluating models
- ✓ Simplifying data sets
- ✓ Using ensembles to improve model performance

Pre- requisites

MATLAB Fundamentals



- ✓ 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:

Importing and Organizing Data

Objective: Bring data into MATLAB and organize it for analysis, including normalizing data and removing observations with missing values.

- Data types
- Tables
- Categorical data
- Data preparation

Preparing for Machine learning

Objective: Learn about the statistics & optimization techniques used, in order to understand the background operations needed for applying Machine learning techniques.

- Basic statistics methods used for Machine Learning
- Regression Methods
- Solver options & Optimization methods

Finding Natural Patterns in Data

Objective: Use unsupervised learning techniques to group observations based on a set of explanatory variables and discover natural patterns in a data set.

- Unsupervised learning
- Self-Organizing Maps
- Clustering methods
- Cluster evaluation and interpretation

Building a Predictive Model

Objective: Use supervised learning techniques to perform predictive modeling, including creating, training, and simulating neural networks in MATLAB. Evaluate the accuracy of a predictive model.

- Supervised learning
- Training and validation
- Classification methods
- Neural Networks

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>



Improving the Model

Objective: Reduce the dimensionality of a data set. Improve and simplify machine learning models.

- Feature transformation
- Feature selection
- Cross validation
- Ensemble learning

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>