Course Title:

MATLAB Programming Techniques

Course Purpose:

This two-day course provides hands-on experience using the features in the MATLAB® language to write efficient, robust, and well-organized code. These concepts form the foundation for writing full applications, developing algorithms, and extending built-in MATLAB capabilities. Details of performance optimization, as well as tools for writing, debugging, and profiling code, are covered. Topics include:

- Utilizing development tools
- Verifying application behavior
- Creating robust applications
- Structuring code
- Structuring data
- Managing data efficiently
- Creating a toolbox

Pre- requisites:

MATLAB Fundamentals

Course Duration

- ✓ 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.

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:

Utilizing Development Tools

Objective: Use integrated tools to manage code, diagnose problems, debug applications, and measure performance.

- Generating reports on multiple files
- Finding potential problems in code
- Debugging code
- Assessing code performance

Verifying Application Behavior

Objective: Create tests to verify that code meets requirements.

- Writing test scripts
- Running test scripts
- Using test functions

Creating Robust Applications

Objective: Create robust applications that withstand unexpected input and produce meaningful errors. Use built-in MATLAB functions and programming constructs, and employ standard techniques for handling error conditions.

- Creating flexible function interfaces
- Checking for warning and error conditions
- Working with the try-catch construct and MException objects

Structuring Code

Objective: Modularize code into readable and maintainable functions. Explore the different function types available in the MATLAB language and the tradeoffs associated with each type. See how function type affects the performance and reliability of the code.

- Private functions
- Local functions
- Nested functions
- Function handles
- Precedence rules
- Comparison of function types

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Structuring Data

Objective: Explore choices for storing data within a MATLAB application.

- Data types
- Cell and structure arrays
- Extracting data
- Concatenation and conversion
- Objects and classes

Managing Data Efficiently

Objective: Use common techniques for improving performance when storing, accessing, and processing data.

- Preallocation
- Vectorization
- Memory management
- Passing data between functions

Creating a Toolbox

Objective: Package code and documentation into a custom toolbox for distribution to other users.

- Creating documentation
- Packaging the toolbox
- Distributing the toolbox

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