

**MATLAB Data Visualization and Charting**

**Course Number:** MTLB-108
**Duration:** 1 day

**Overview**

In this MATLAB Data Visualization and Charting training course, attendees learn how to display and visualize data from different formats, including numeric, time-series, categorical, geographic, images, movies, and more. Students learn MATLAB’s numerous charting and presentation options and various formats. In addition, participants learn about design principles, compatibility considerations across MATLAB releases, and aspects of run-time performance.

**Prerequisites**

Students must be comfortable using the MATLAB environment. No prior programming experience or familiarity is assumed for this course. However, familiarity with MATLAB scripting/programming would be helpful.

**Materials**

All MATLAB training students will receive comprehensive courseware.

**Software Needed on Each Student PC**

* Any Windows, Linux, or macOS operating system
* A recent version of MATLAB

**Objectives**

* Experience alternative methods for presenting data and analysis results in MATLAB
* Understand how and when to use different MATLAB graph types
* Apply good design principles for clear visualization
* Discover how to manipulate and customize graphs and images
* Understand how to create and display images and movies
* Learn how to store and reuse charts and images
* Use specialized chart types (geo bubbles, heatmaps, etc.)

**Outline**

* Introduction to MATLAB Data Visualization
	+ Comparison of MATLAB visualization methods
	+ Tradeoff considerations
	+ General design principles
	+ MATLAB graphics evolution and roadmap
* Displaying Data in Graphs
	+ Comparison of 2D, 2.5D, and 3D graphs
	+ Customizing graphs
	+ Colormaps and colorbars
	+ Plot annotations and data tips
	+ Legends
	+ Controlling zoom, pan, lighting, rotation
	+ Patches and transparency
	+ Using NaNs as a plotting technique
	+ Extracting data from existing plots
	+ Displaying multiple figure plots
	+ Sub-plots and stacked plots
* Programmatic MATLAB Graphics
	+ Handle Graphics
	+ The inspector tool
	+ Figure, axes, and plot properties
	+ Interactive vs. programmatic control
	+ Manipulating graphic properties
	+ Modifying the displayed data-tips
	+ Extending built-in graphics with customized charts
	+ Exporting figures & plots
	+ Generating an m-file to recreate a graph
	+ Updating plots in run-time
	+ Performance considerations
* Images and Movies
	+ Loading and displaying images
	+ Image manipulations
	+ Animating graphics
	+ Creating and displaying movies
* Conclusion