

**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