MATLAB for Data Processing Training Course

Professional Development Training Course Outline

Category	Research and Data Analysis	**Duration**	10 Days
Base Fee	$3,000 USD	**Delivery Mode**	Online / On-site Hybrid

Course Introduction

In the era of Big Data and advanced analytics, mastering MATLAB for data processing has become indispensable for professionals, researchers, and engineers. MATLAB provides a robust environment for data manipulation, visualization, statistical analysis, and algorithm development, making it a preferred tool in industries such as finance, healthcare, engineering, and AI-driven research. MATLAB for Data Processing Training Course equips participants with practical skills to clean, transform, analyze, and visualize complex datasets efficiently, enabling faster decision-making and improved business insights.

Our hands-on MATLAB training course is designed to bridge the gap between theoretical knowledge and real-world application. Participants will learn to leverage advanced data processing techniques, automation, and simulation tools to solve practical problems. Through interactive case studies and projects, learners will gain confidence in signal processing, machine learning integration, predictive analytics, and high-performance data handling. By the end of this course, participants will possess industry-ready MATLAB expertise to excel in data-driven decision-making and computational modeling.

Programme Curriculum

MATLAB for Data Processing Training Course

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Course Objectives

1. Master MATLAB environment and essential functions for data processing.
2. Understand data import/export, cleaning, and transformation techniques.
3. Develop data visualization skills using MATLAB plotting tools.
4. Implement statistical analysis and hypothesis testing in MATLAB.
5. Apply signal processing techniques for real-world datasets.
6. Learn machine learning integration within MATLAB.
7. Perform time-series analysis and forecasting.
8. Optimize algorithms for high-performance data processing.
9. Develop automation scripts for repetitive data tasks.
10. Analyze large datasets using MATLAB's advanced toolboxes.
11. Conduct predictive analytics and modeling in MATLAB.
12. Solve engineering and scientific problems using MATLAB simulation.
13. Gain practical experience through case studies and project-based learning.

Target Audience

1. Data Analysts
2. Data Scientists
3. Research Scholars
4. Engineers
5. AI and Machine Learning Enthusiasts
6. Statisticians
7. Finance Professionals
8. Students in STEM fields

Course Modules

Module 1: Introduction to MATLAB

- Overview of MATLAB interface and workspace
- Data types and variables
- Basic operations and arithmetic
- Built-in functions and help documentation
- **Case Study:** Analyzing a small dataset from a lab experiment

Module 2: Data Import and Export

- Reading data from Excel, CSV, and text files
- Writing data to various formats

- Using **MAT-file storage for large datasets**
- Data type conversion techniques
- **Case Study:** Importing financial datasets for analysis

Module 3: Data Cleaning and Preprocessing

- Handling missing and inconsistent data
- Filtering and smoothing datasets
- Data normalization and scaling
- Outlier detection techniques
- **Case Study:** Cleaning sensor data from IoT devices

Module 4: Data Visualization

- 2D and 3D plotting
- Customizing graphs and charts
- Interactive visualization using MATLAB apps
- Heatmaps and surface plots
- **Case Study:** Visualizing climate data trends

Module 5: Statistical Analysis

- Descriptive statistics and distributions
- Correlation and regression analysis
- Hypothesis testing
- ANOVA and t-tests
- **Case Study:** Analyzing medical research data

Module 6: Signal Processing

- Introduction to signals and systems
- Filtering techniques
- Fourier Transform and spectral analysis
- Noise reduction strategies
- **Case Study:** Processing ECG signals

Module 7: Time-Series Analysis

- Time-series data handling
- Trend, seasonality, and forecasting
- Moving averages and exponential smoothing
- Autoregressive models
- **Case Study:** Predicting stock prices

Module 8: Machine Learning Integration

- Overview of MATLAB ML Toolbox
- Classification and regression models
- Model evaluation and cross-validation
- Deploying models in MATLAB
- **Case Study:** Predicting customer churn using MATLAB

Module 9: Automation with Scripts and Functions

- Writing MATLAB scripts
- Creating reusable functions
- Loops and conditional statements
- Automating repetitive tasks
- **Case Study:** Automating monthly report generation

Module 10: Advanced MATLAB Programming

- Object-oriented programming concepts
- Error handling and debugging
- Performance optimization
- Working with structures and cell arrays
- **Case Study:** Optimizing simulation code for speed

Module 11: High-Performance Computing

- Parallel computing toolbox
- GPU acceleration in MATLAB
- Memory management for large datasets
- Performance benchmarking
- **Case Study:** Large-scale simulation of traffic patterns

Module 12: Predictive Analytics and Modeling

- Regression and predictive models
- Scenario simulation
- Sensitivity analysis
- Model validation techniques
- **Case Study:** Predicting energy consumption trends

Module 13: Image and Video Data Processing

- Image reading and display
- Basic image processing
- Video frame extraction and analysis
- Feature detection techniques
- **Case Study:** Detecting defects in manufacturing images

Module 14: Engineering and Scientific Simulations

- Simulink basics for system modeling
- Dynamic system simulation
- Signal-flow and block diagrams
- Parameter tuning and analysis
- **Case Study:** Simulating an electrical circuit system

Module 15: Capstone Project and Case Studies

- Integrating multiple modules for a comprehensive project
- Real-world problem-solving using MATLAB

- Presentation and reporting techniques
- Peer review and feedback
- **Case Study:** Full data processing workflow for smart city traffic

Training Methodology

This course employs a participatory and hands-on approach to ensure practical learning, including:

- Interactive lectures and presentations.
- Group discussions and brainstorming sessions.
- Hands-on exercises using real-world datasets.
- Role-playing and scenario-based simulations.
- Analysis of case studies to bridge theory and practice.
- Peer-to-peer learning and networking.
- Expert-led Q&A sessions.
- Continuous feedback and personalized guidance.

Register as a group from 3 participants for a Discount

Send us an email: info@fineskilltrainingcenter.org or call +254769199797

Certification

Upon successful completion of this training, participants will be issued with a globally- recognized certificate.

Tailor-Made Course

We also offer tailor-made courses based on your needs.

Key Notes

a. The participant must be conversant with English.

b. Upon completion of training the participant will be issued with an Authorized Training Certificate

c. Course duration is flexible and the contents can be modified to fit any number of days.

d. The course fee includes facilitation training materials, 2 coffee breaks, buffet lunch and A Certificate upon successful completion of Training.

e. One-year post-training support Consultation and Coaching provided after the course.

f. Payment should be done at least a week before commence of the training, to Fineskill Training Center account, as indicated in the invoice so as to enable us prepare better for you.

Upcoming Scheduled Sessions

Start Date	End Date	Location	Price
23 Nov 2026	04 Dec 2026	Online	$2,000
23 Nov 2026	04 Dec 2026	Physical	$3,000
23 Nov 2026	04 Dec 2026	Physical	$6,000
23 Nov 2026	04 Dec 2026	Physical	$6,000
23 Nov 2026	04 Dec 2026	Physical	$12,000
23 Nov 2026	04 Dec 2026	Physical	$9,000
23 Nov 2026	04 Dec 2026	Physical	$12,000
23 Nov 2026	04 Dec 2026	Physical	$12,000

Ready to enroll or request a customized program? Book online or contact us:

Register Online Now

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