

Mastering Data Analytics

Duration: 5 days

◆ **Module 1: Logical & Reliable Data Analysis**

- Importing data into Excel
- Best practices in data analysis
- Descriptive statistics and their real meanings
- Performing frequency analysis
- Using Pivot Tables & Charts
- Handling noisy/incomplete data & dealing with outliers

◆ **Module 2: Data Mode Shape Analysis & Scenario Analysis**

- Plotting data against time
- Generating data mode shapes
- Fitting curves to data
- Correlating mode shape to time-based events
- Interpreting time series analyses
- Moving average calculations
- Representing analytical problems as multi-input, single-output (MISO) systems
- Deterministic systems analysis
- "What-if" & visual scenario analysis
- Dynamic & interactive spreadsheets
- Measuring the sensitivity of calculated variables

◆ **Module 3: Regression Analysis & Predictive Modelling**

- Equations of curves
- Predicting future behavior using regression analysis

- Linear, polynomial, exponential, and power curve fits
- The dangers of overfitting
- Goodness of fit: SSE, R^2 , Adjusted R^2
- Evaluating equations, solving equations, and using Solver
- Correlation vs. causality

Predictive Modeling Using Regression (Excel & XLminer):

- Understanding Predictive Modeling
- Building a Regression Model in XLminer
- Model Performance Evaluation (R^2 , Adjusted R^2 , MSE, RMSE, MAE)

Hands-on Exercise: Predicting Sales Revenue using Ad Spend & Market Trends

◆ **Module 4: Classification Using Logistic Regression & Evaluation Metrics**

- Understanding Classification in Machine Learning
- Building a Logistic Regression Model in Excel & XLminer
- Interpreting Logistic Regression Coefficients
- Model Performance Evaluation:
 - Confusion Matrix Calculation (TP, FP, FN, TN)
 - Precision, Recall, F1-Score Computation in Excel
 - ROC Curve & AUC (Manual Plot in Excel)
- **Hands-on Exercise: Predicting Employee Attrition (Will an employee leave or stay?)**

◆ **Module 5: Data-Driven Methods, ANOVA & Optimization Techniques**

- Non-deterministic system analysis
- Data-driven methods for prediction
- One-step ahead future prediction using multivariate correlation
- Single & two-factor ANOVA
- Optimization with Solver: Finding optimal regression coefficients

- **AI Demonstration:** The Travelling Salesman Problem
-

 **Notes:**

- ✓ This course is designed for Excel-based Machine Learning training using XLminer and built-in tools.
- ✓ Includes hands-on exercises, practical case studies, and real-world applications.