

Data Science & Machine Learning

An end-to-end diploma program in Data Science and Machine Learning covering Python, statistics, exploratory data analysis, feature engineering, supervised/unsupervised ML models, AI integration, and deployment.

Duration 6 to 8 Months	Training Mode Offline Classroom Training	Certification Industry Certificate	Practical Labs 100% Hands-on
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Tools & Tech: Python • Pandas • NumPy • Scikit-Learn • Matplotlib • Seaborn • TensorFlow • Flask/FastAPI

Detailed Course Curriculum & Modules

MODULE 01 Introduction to Data Science & Machine Learning - Data Science Fundamentals - What is Data Science? - Data Science vs Data Analytics vs Artificial Intelligence - Machine Learning vs Deep Learning - Data Science Life Cycle - CRISP-DM Methodology - Real-World Applications of Data Science - Understanding Business Problems - End-to-End Data Science Workflow - Career Opportunities in Data Science - Introduction to Research & Experimentation	MODULE 02 Python for Data Science - Python Fundamentals - Python Refresher - Variables & Data Types - Operators - Conditional Statements - Loops - Functions - Modules & Packages - Exception Handling - File Handling - Object-Oriented Programming Basics - Scientific Computing
MODULE 03 Statistics & Mathematics for Machine Learning - Statistical Foundations - Types of Data - Descriptive Statistics - Probability Theory - Probability Distributions - Mean, Median & Mode - Variance & Standard Deviation - Correlation & Covariance - Normal Distribution - Sampling Techniques - Central Limit Theorem - Inferential Statistics	MODULE 04 Data Visualization & Exploratory Data Analysis (EDA) - Data Visualization - Data Visualization Principles - Choosing Appropriate Charts - Matplotlib - Seaborn - Plotly (Introduction) - Statistical Charts - Correlation Heatmaps - Pair Plots - Distribution Plots - Interactive Visualizations - Exploratory Data Analysis
MODULE 05 Data Preprocessing & Feature Engineering - Data Preparation - Data Collection - Data Cleaning - Handling Missing Values - Handling Outliers - Encoding Categorical Variables - Feature Scaling - Standardization - Normalization - Train-Test Split - Data Leakage Prevention - Feature Engineering	MODULE 06 Machine Learning Fundamentals - Introduction to Machine Learning - Machine Learning Workflow - Types of Machine Learning - Supervised Learning - Unsupervised Learning - Semi-Supervised Learning - Reinforcement Learning (Introduction) - Bias vs Variance - Overfitting & Underfitting - Model Evaluation Basics - Machine Learning with Scikit-learn - Introduction to Scikit-learn
MODULE 07 Supervised Machine Learning - Regression Algorithms - Linear Regression - Multiple Linear Regression - Polynomial Regression - Ridge Regression - Lasso Regression - ElasticNet Regression - Classification Algorithms - Logistic Regression - K-Nearest Neighbors (KNN) - Decision Trees - Random Forest	MODULE 08 Unsupervised Machine Learning - Clustering - K-Means Clustering - Hierarchical Clustering - DBSCAN - Dimensionality Reduction - Principal Component Analysis (PCA) - t-SNE (Introduction) - Association Rule Learning - Apriori Algorithm - Market Basket Analysis - Anomaly Detection - Isolation Forest

MODULE 09 | Model Evaluation & Optimization

- Model Performance
- Training vs Testing
- Validation Techniques
- Cross Validation
- Confusion Matrix
- Accuracy
- Precision
- Recall
- F1 Score
- ROC Curve
- AUC Score
- Model Optimization

MODULE 10 | AI for Data Science

- Generative AI for Data Scientists
- ChatGPT for Data Science
- Claude for Research
- Gemini for Code Generation
- AI-Assisted Data Cleaning
- AI Feature Engineering
- AI Model Explanation
- AI Report Generation
- AI Visualization Suggestions
- AI Documentation
- AI Experiment Assistance
- Prompt Engineering for Data Science

MODULE 11 | Machine Learning Deployment

- Deploying ML Models
- Saving Models
- Pickle & Joblib
- Building Prediction APIs
- Flask Basics
- FastAPI Basics
- Model Inference
- Batch Predictions
- Real-Time Predictions
- Introduction to Cloud Deployment

Practical Projects & Industry Capstones

- House Price Prediction System
- Student Performance Prediction
- Customer Churn Prediction
- Loan Approval Prediction
- Credit Risk Analysis
- Employee Attrition Prediction
- Sales Forecasting
- Customer Segmentation System
- Recommendation System
- Spam Email Classifier
- Disease Prediction System
- Movie Recommendation Engine
- AI-Powered Predictive Analytics Dashboard
- End-to-End Machine Learning Pipeline

■ Industry Certification

Authorized certificate verified globally via online portal.

■ 100% Placement Support

Resume review, mock interviews, and recruiter connections.

■ Lab Access & Mentorship

Dedicated workstation lab hours with expert guidance.