Python for Transport Data Analysts Training Course

Professional Development Training Course Outline

Category	Traffic Management & Road Safety	**Duration**	10 Days
Base Fee	$3,000 USD	**Delivery Mode**	Online / On-site Hybrid

Course Introduction

Python for Transport Data Analysts Training Course is designed to empower transport professionals with cutting-edge data analytics, predictive modeling, and automation skills using Python. Transport data, ranging from traffic flow and route optimization to public transport scheduling and demand forecasting, presents complex challenges that require sophisticated analytical techniques. This course blends practical Python programming, data visualization, and machine learning applications tailored specifically for the transportation sector. Participants will acquire actionable skills to transform raw transport data into insightful, data-driven decisions, improving efficiency, safety, and sustainability in mobility networks.

Through a hands-on, case-based approach, learners will explore real-world datasets, including vehicle GPS data, traffic sensor information, and public transit usage patterns. The course emphasizes trend-focused skills in predictive analytics, geospatial analysis, and data visualization, enabling professionals to uncover hidden patterns, forecast demand, and optimize operations. By the end of the training, participants will confidently leverage Python’s robust libraries such as Pandas, NumPy, Matplotlib, Seaborn, and Scikit-learn to deliver actionable insights and drive strategic decisions in the transportation sector.

Programme Curriculum

Python for Transport Data Analysts Training Course

Introduction

Python for Transport Data Analysts Training Course is designed to empower transport professionals with cutting-edge data analytics, predictive modeling, and automation skills using Python. Transport data, ranging from traffic flow and route optimization to public transport scheduling and demand forecasting, presents complex challenges that require sophisticated analytical techniques. This course blends practical Python

programming, data visualization, and machine learning applications tailored specifically for the transportation sector. Participants will acquire actionable skills to transform raw transport data into insightful, data-driven decisions, improving efficiency, safety, and sustainability in mobility networks.

Through a hands-on, case-based approach, learners will explore real-world datasets, including vehicle GPS data, traffic sensor information, and public transit usage patterns. The course emphasizes trend-focused skills in predictive analytics, geospatial analysis, and data visualization, enabling professionals to uncover hidden patterns, forecast demand, and optimize operations. By the end of the training, participants will confidently leverage Python's robust libraries such as Pandas, NumPy, Matplotlib, Seaborn, and Scikit-learn to deliver actionable insights and drive strategic decisions in the transportation sector.

Course Duration

10 days

Course Objectives

1. Master Python programming for transport data analysis.
2. Conduct predictive modeling for traffic flow and demand forecasting.
3. Apply geospatial analysis to optimize routes and public transport networks.
4. Utilize data visualization techniques for actionable insights.
5. Build machine learning models for transport demand prediction.
6. Perform real-time transport data analytics for dynamic decision-making.
7. Implement data cleaning and preprocessing for large transport datasets.
8. Analyze vehicle telematics and GPS data effectively.
9. Use time-series analysis for traffic pattern identification.
10. Optimize public transport scheduling and fleet management.
11. Develop interactive dashboards for transport performance monitoring.
12. Integrate big data analytics in transportation planning.
13. Explore emerging AI trends in mobility and transport systems.

Target Audience

1. Transport planners and engineers
2. Data analysts in mobility and logistics
3. Urban planners
4. Traffic management professionals
5. Public transport operators
6. Smart city consultants
7. IoT and connected vehicle specialists
8. Graduate students in transport engineering or data science

Course Modules

Module 1: Python Fundamentals for Transport Analytics

- Python syntax, variables, and data types
- Conditional statements and loops
- Functions and modules
- File handling and data input/output
- **Case Study:** Automating daily traffic data reporting

Module 2: Data Cleaning & Preprocessing

- Handling missing values and duplicates
- Data type conversions
- Outlier detection and treatment
- String and date-time manipulation
- **Case Study:** Cleaning GPS-based vehicle movement data

Module 3: Pandas for Transport Data Analysis

- DataFrames and Series
- Indexing, filtering, and sorting
- Aggregation and group operations
- Merging and joining datasets
- **Case Study:** Analyzing bus ridership data

Module 4: NumPy for Numerical Transport Analytics

- Array creation and manipulation
- Mathematical operations and broadcasting
- Statistical computations
- Linear algebra applications
- **Case Study:** Traffic volume matrix calculations

Module 5: Data Visualization with Matplotlib & Seaborn

- Line, bar, and scatter plots
- Heatmaps and correlation plots
- Customizing charts for transport KPIs
- Interactive plotting techniques
- **Case Study:** Visualizing traffic congestion trends

Module 6: Geospatial Analysis with Python

- Introduction to GeoPandas and Shapely
- Spatial joins and overlays
- Mapping transport networks
- Geospatial visualization
- **Case Study:** Optimizing city bus routes using GIS data

Module 7: Time-Series Analysis

- Date-time handling in Python
- Moving averages and smoothing
- Seasonal decomposition
- Forecasting with ARIMA
- **Case Study:** Forecasting hourly traffic volumes

Module 8: Exploratory Data Analysis (EDA)

- Descriptive statistics for transport datasets
- Correlation and pattern discovery

- Outlier and anomaly detection
- Visualization-based insights
- **Case Study:** Identifying accident-prone zones

Module 9: Machine Learning Basics

- Supervised vs unsupervised learning
- Regression and classification models
- Model evaluation metrics
- Feature selection and engineering
- **Case Study:** Predicting peak-hour traffic congestion

Module 10: Advanced Machine Learning

- Random Forest and Gradient Boosting
- Support Vector Machines
- Clustering techniques (K-Means, DBSCAN)
- Model optimization and tuning
- **Case Study:** Segmenting city commuters for route optimization

Module 11: Real-Time Transport Data Analytics

- Introduction to streaming data
- Working with APIs for live data
- Real-time visualization dashboards
- Alerting and monitoring systems
- **Case Study:** Live monitoring of urban traffic sensors

Module 12: Public Transport Optimization

- Route scheduling and frequency optimization
- Load factor analysis
- Multi-modal integration
- KPI tracking for public transit
- **Case Study:** Bus fleet scheduling optimization

Module 13: Fleet Management Analytics

- Vehicle tracking and telematics
- Fuel efficiency and route optimization
- Predictive maintenance
- Performance dashboards
- **Case Study:** Optimizing delivery fleet operations

Module 14: Big Data & Cloud Tools

- Introduction to PySpark
- Handling large transport datasets
- Cloud-based data storage and processing
- Scalable analytics pipelines
- **Case Study:** Analyzing city-wide smart traffic data

Module 15: Capstone Project & Dashboard Development

- Integrating all course skills
- End-to-end transport data analysis
- Building interactive dashboards (Plotly/Dash)
- Presenting actionable insights
- **Case Study:** Smart city traffic and public transport dashboard

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

Email: info@fineskilltrainingcenter.com | Website: www.fineskilltrainingcenter.com