Time Series Forecasting with Machine Learning Training Course

Professional Development Training Course Outline

Category	Logistics and Supply Chain Management	**Duration**	5 Days
Base Fee	$1,500 USD	**Delivery Mode**	Online / On-site Hybrid

Course Introduction

In today’s data-driven world, Time Series Forecasting with Machine Learning has become an essential skill for professionals working in fields like finance, retail, energy, and healthcare. Time Series Forecasting with Machine Learning Training Course introduces learners to advanced machine learning techniques for predictive analytics using real-world time series data. With the rise of big data and AI, being proficient in time-dependent forecasting gives businesses a competitive edge through improved decision-making and resource optimization.

This hands-on course is packed with cutting-edge algorithms, deep learning techniques, and practical forecasting strategies using Python, R, and other popular tools. Participants will learn to build, evaluate, and deploy models using ARIMA, LSTM, XGBoost, and Prophet, among others. With a strong focus on real-world applications, the course combines theory, live demonstrations, and case studies from various industries to ensure practical understanding.

Programme Curriculum

Time Series Forecasting with Machine Learning Training Course

Introduction

In today’s data-driven world, Time Series Forecasting with Machine Learning has become an essential skill for professionals working in fields like finance, retail, energy, and healthcare. Time Series Forecasting with Machine Learning Training Course introduces learners to advanced machine learning techniques for predictive analytics using real-world time series data. With the rise of big data and AI, being proficient in time-dependent forecasting gives businesses a competitive edge through improved decision-making and resource optimization.

This hands-on course is packed with cutting-edge algorithms, deep learning techniques, and practical forecasting strategies using Python, R, and other popular tools. Participants will learn to build, evaluate, and deploy models using ARIMA,

LSTM, XGBoost, and Prophet, among others. With a strong focus on real-world applications, the course combines theory, live demonstrations, and case studies from various industries to ensure practical understanding.

Course Objectives

1. Understand the fundamentals of time series data and its unique characteristics.
2. Apply statistical and machine learning techniques for trend, seasonality, and anomaly detection.
3. Develop autoregressive models including AR, MA, ARIMA, and SARIMA.
4. Master deep learning models like RNN and LSTM for sequential forecasting.
5. Implement Facebook Prophet for interpretable forecasting.
6. Utilize ensemble methods such as Random Forest and XGBoost.
7. Perform multivariate time series analysis.
8. Conduct time series cross-validation and performance evaluation.
9. Apply Python libraries (pandas, statsmodels, scikit-learn) and R packages for forecasting tasks.
10. Automate forecasting pipelines and model tuning.
11. Leverage cloud-based tools for scalable forecasting (AWS, GCP).
12. Integrate forecasting models into business dashboards and APIs.
13. Analyze real-world case studies across finance, retail, and healthcare.

Target Audiences

1. Data Scientists & Machine Learning Engineers
2. Business Intelligence Analysts
3. Financial Analysts & Planners
4. Supply Chain Analysts
5. Operations Managers
6. IT Professionals & Developers
7. Students in Data Science & AI programs
8. Academics & Researchers in Econometrics and Forecasting

Course Duration: 5 days

Course Modules

Module 1: Introduction to Time Series

- Time series data structure & components
- Exploratory data analysis (EDA) techniques
- Visualizing trends, cycles, and seasonality
- Stationarity & transformation methods
- Data decomposition and smoothing
- **Case Study**: Seasonal sales analysis in retail

Module 2: Classical Forecasting Methods

- Moving averages and exponential smoothing
- Holt-Winters method
- AR, MA, ARIMA models
- SARIMA for seasonal modeling
- Forecasting accuracy metrics
- **Case Study**: Forecasting electricity demand

Module 3: Machine Learning for Time Series

- Time series framing for ML models

- Feature engineering & lag variables
- Supervised learning (Random Forest, XGBoost)
- Recursive vs direct forecasting
- Model evaluation and tuning
- **Case Study**: Predicting stock prices

Module 4: Deep Learning Models

- Introduction to sequence modeling
- RNN and LSTM architectures
- Model building using TensorFlow/Keras
- Handling long sequences and overfitting
- Training and validation with time windows
- **Case Study**: Health monitoring using sensor data

Module 5: Prophet & Hybrid Models

- Facebook Prophet: components and setup
- Handling holidays and events
- Comparison with traditional models
- Building hybrid models with ARIMA + ML
- Advanced model stacking techniques
- **Case Study**: Forecasting airline passenger data

Module 6: Multivariate Time Series

- Vector Autoregression (VAR) basics
- Granger causality tests
- Feature correlation and selection
- Cointegration and differencing
- Implementation in Python
- **Case Study**: Economic indicator forecasting

Module 7: Forecasting at Scale

- Deploying models on AWS/GCP/Azure
- Automating data pipelines with Airflow
- Using MLFlow for model management
- Time series forecasting in BigQuery
- Integrating with BI dashboards
- **Case Study**: Real-time forecasting for eCommerce traffic

Module 8: Capstone Project & Evaluation

- End-to-end forecasting project
- Model development, validation, and deployment
- Documentation and presentation skills
- Peer review and feedback
- Final evaluation and certification
- **Case Study**: Custom project based on industry

Training Methodology

- Instructor-led live sessions with interactive demos
- Real-world case studies and hands-on labs
- Project-based learning with continuous feedback

- Group discussions and breakout problem-solving
- Access to code notebooks, datasets, and tools

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	27 Nov 2026	Online	$1,000
23 Nov 2026	27 Nov 2026	Physical	$1,500
23 Nov 2026	27 Nov 2026	Physical	$3,000
23 Nov 2026	27 Nov 2026	Physical	$3,000
23 Nov 2026	27 Nov 2026	Physical	$6,000
23 Nov 2026	27 Nov 2026	Physical	$4,500
23 Nov 2026	27 Nov 2026	Physical	$6,000
23 Nov 2026	27 Nov 2026	Physical	$6,000

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

Register Online Now

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