# Time Series Analysis and Forecasting Training Course

Professional Development Training Course Outline

| | | | |
|---|---|---|---|
| **Category** | Research and Data Analysis | **Duration** | 5 Days |
| **Base Fee** | $1,500 USD | **Delivery Mode** | Online / On-site Hybrid |

## Course Introduction

In today’s data-driven world, time series analysis and forecasting models like ARIMA (AutoRegressive Integrated Moving Average) and GARCH (Generalized Autoregressive Conditional Heteroskedasticity) are pivotal for making informed decisions in sectors such as finance, economics, healthcare, and energy. Time Series Analysis and Forecasting Training Course is designed to empower data professionals, financial analysts, economists, and researchers with the skills to analyze temporal data, forecast future values, and model volatility accurately using state-of-the-art time series techniques.

Through hands-on projects, real-world case studies, and guided instruction from industry experts, participants will gain advanced analytical capabilities, enabling them to apply ARIMA and GARCH models using Python, R, and other statistical software. This course bridges the gap between theoretical foundations and practical implementation, offering an SEO-optimized, market-relevant curriculum tailored to current industry demands in data science, machine learning, and financial risk modeling.

## Programme Curriculum

**Time Series Analysis and Forecasting Training Course**

**Introduction**

In today’s data-driven world, time series analysis and forecasting models like ARIMA (AutoRegressive Integrated Moving Average) and GARCH (Generalized Autoregressive Conditional Heteroskedasticity) are pivotal for making informed decisions in sectors such as finance, economics, healthcare, and energy. Time Series Analysis and Forecasting Training Course is designed to empower data professionals, financial analysts, economists, and researchers with the skills to analyze temporal data, forecast future values, and model volatility accurately using state-of-the-art time series techniques.

Through hands-on projects, real-world case studies, and guided instruction from industry experts, participants will gain advanced analytical capabilities, enabling them to apply ARIMA and GARCH models using Python, R, and other statistical software. This course bridges the gap between theoretical foundations and practical implementation, offering an SEO-optimized, market-relevant curriculum tailored to current industry demands in data science, machine learning, and financial risk modeling.

**Course Objectives**

1. Understand the fundamentals of time series data structure and components.
2. Apply stationarity tests using Augmented Dickey-Fuller (ADF) and KPSS.
3. Master the concepts and applications of ARIMA modeling.
4. Build and evaluate GARCH models for volatility forecasting.
5. Perform model diagnostics and residual analysis.
6. Use ACF and PACF plots to identify model parameters.
7. Implement time series models using Python (pandas, statsmodels).
8. Understand the application of R for time series forecasting.
9. Apply forecast accuracy metrics such as MAPE, MAE, and RMSE.
10. Work with financial time series datasets for real-world relevance.
11. Understand seasonality, trend, and cyclic behavior in data.
12. Use machine learning extensions in time series forecasting.
13. Develop data-driven strategies for business intelligence.

**Target Audiences**

1. Financial analysts and investment professionals
2. Data scientists and statisticians
3. Economists and economic researchers
4. Quantitative analysts
5. Business intelligence professionals
6. Academics and postgraduate students
7. Data engineers and software developers
8. Professionals transitioning to AI-driven analytics

**Course Duration:** 5 days

**Course Modules**

**Module 1: Introduction to Time Series Analysis**

- Understand what time series data is
- Components of time series: trend, seasonality, noise
- Importance of time series in forecasting
- Types of time series (univariate vs multivariate)
- Software tools: R, Python, Excel
- **Case Study**: Daily sales analysis for retail company

**Module 2: Stationarity and Differencing**

- What is stationarity?
- Augmented Dickey-Fuller (ADF) Test
- KPSS Test and interpretations
- Differencing techniques and transformation
- Visualizing stationarity
- **Case Study**: Inflation rate trend stability

**Module 3: ARIMA Model Fundamentals**

- Introduction to AR, MA, and ARMA models
- Building ARIMA models step-by-step
- Parameter selection using AIC/BIC
- Forecasting using ARIMA
- Validating model accuracy
- **Case Study**: Forecasting electricity demand

**Module 4: Seasonality and SARIMA Models**

- Detecting seasonal patterns
- SARIMA vs ARIMA
- Parameter tuning for SARIMA
- Implementing SARIMA in Python
- Interpreting model outputs
- **Case Study**: Airline passenger data forecasting

**Module 5: Introduction to GARCH Models**

- Understanding volatility clustering
- ARCH and GARCH models explained
- Selecting GARCH orders
- Interpreting conditional variance
- Using R's "rugarch" or Python's "arch" library
- **Case Study**: Modeling stock market volatility

**Module 6: Model Diagnostics and Forecast Evaluation**

- Residual diagnostics and Ljung-Box test
- ACF/PACF of residuals
- Checking heteroskedasticity
- Measuring forecast accuracy (MAPE, RMSE)
- Model selection strategies
- **Case Study**: Forecast error evaluation in sales

**Module 7: Advanced Forecasting Techniques**

- Time series cross-validation
- Vector Autoregressive Models (VAR) basics
- Machine Learning approaches (Random Forest, LSTM)
- Rolling forecast techniques
- Model deployment and automation
- **Case Study**: Forecasting cryptocurrency prices

**Module 8: Capstone Project and Business Applications**

- Define project objectives and KPIs
- Select appropriate model (ARIMA vs GARCH)
- Forecasting and business implications
- Visualization and report generation
- Presentation and peer review
- **Case Study**: Comprehensive business forecasting strategy

**Training Methodology**

- Instructor-led live virtual or on-site sessions

- Practical hands-on exercises with datasets
- Real-world case studies in each module
- Group projects and capstone presentations
- Access to code templates and forecasting tools
- Post-course support and resource library

**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 |

| Start Date | End Date | Location | Price |
|---|---|---|---|
| **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