Portfolio Optimization Techniques Training Course

Professional Development Training Course Outline

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

Course Introduction

The modern investment landscape is characterized by unprecedented market volatility and the rapid democratization of complex quantitative finance tools. In this environment, mere diversification is no longer sufficient; superior performance and disciplined risk management require rigorous application of Portfolio Optimization Techniques. Portfolio Optimization Techniques Training Course is designed to transition finance professionals from theoretical understanding to practical mastery of cutting-edge models. We focus on techniques that address real-world challenges namely, model instability, estimation error, and the integration of non-traditional data. By prioritizing algorithmic trading readiness and risk-adjusted returns, this program ensures participants are equipped to build robust, scalable investment strategies that deliver a significant competitive advantage in asset management.

The core challenge in finance today lies in moving beyond the foundational Mean-Variance Optimization (MVO) framework to leverage advanced methodologies like Robust Optimization and machine learning-driven allocation. This training offers a deep dive into programming-centric approaches, utilizing Python and advanced libraries for live data analysis and backtesting. Participants will learn to model and manage portfolio constraints, integrate ESG investing factors, and calculate next-generation risk metrics like Conditional Value-at-Risk (CVaR). Successful completion empowers attendees to drive innovation in their firms, develop proprietary optimization engines, and secure superior alpha generation in an increasingly data-driven world.

Programme Curriculum

Portfolio Optimization Techniques Training Course

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Course Duration

5 days

Course Objectives

1. Master the mathematical foundations of Modern Portfolio Theory (MPT).
2. Implement and critique the Black-Litterman Model for incorporating investor views.
3. Apply Robust Optimization to mitigate parameter uncertainty and estimation error.
4. Develop custom Risk Parity portfolios to achieve equal risk contribution across assets.
5. Program and backtest advanced strategies using Python for scalable solutions.
6. Calculate and deploy next-generation Coherent Risk Measures like CVaR/Expected Shortfall.
7. Integrate ESG and Sustainable Finance criteria into quantitative optimization frameworks.
8. Model and solve optimization problems involving Transaction Costs and Liquidity Constraints.
9. Construct and evaluate the Efficient Frontier across various asset classes
10. Utilize Machine Learning algorithms for dynamic asset allocation and factor weighting.
11. Perform rigorous Stress Testing and Scenario Analysis on optimized portfolios.
12. Design and execute automated Portfolio Rebalancing rules and workflows.
13. Achieve consistent Alpha Generation through systematic, optimized strategy deployment.

Target Audience

1. Portfolio Managers.
2. Quantitative Analysts.
3. Risk Managers.
4. Financial Data Scientists.
5. Investment Strategists
6. Hedge Fund Analysts.
7. Wealth Managers/Advisors.
8. Financial Engineers.

Course Modules

1. Foundations of Classic & Modern Optimization

- The mechanics of Markowitz Mean-Variance Optimization
- Understanding the limitations.
- The Capital Asset Pricing Model and the Security Market Line
- Sharpe Ratio maximization and the Tangency Portfolio.
- Case Study: Optimizing a Global 60/40 Portfolio using MVO and analyzing its out-of-sample instability.

2. Advanced Mean-Variance Extensions

- Introduction to the Black-Litterman Model to blend market equilibrium with subjective views.
- Programming the BL posterior distribution and implied returns.
- Handling practical constraints.
- Estimating and regularizing covariance matrices
- Case Study: Applying Black-Litterman to incorporate a Bullish View on the Technology sector into an existing All-Weather Fund.

3. Risk Parity and Factor-Based Allocation

- Risk Budgeting principles and the concept of equal risk contribution
- Implementing Risk Parity strategies across three asset classes
- Introduction to Factor Investing
- Constructing a portfolio optimized for exposure to specific factors.
- Case Study: Building a Volatility-Targeted All-Weather Portfolio and comparing its risk-adjusted returns against a traditional MVO benchmark during a market drawdown.

4. Robust and Alternative Optimization

- Techniques for Robust Optimization to protect against worst-case scenarios.
- Utilizing Conditional Value-at-Risk / Expected Shortfall instead of Volatility
- Solving the portfolio problem using Linear Programming and Quadratic Programming solvers.
- Optimization under drawdown constraints
- Case Study: Optimizing a portfolio to minimize CVaR using historical data from the 2008 Global Financial Crisis to demonstrate tail risk reduction.

5. Programming and Data Infrastructure

- Setting up the quantitative environment with Python, pandas, NumPy, and cvxpy.
- Efficiently handling and cleaning financial time series data
- Automating the fetching of market data and economic indicators.
- Developing a complete backtesting framework for optimized strategies.
- Case Study: Writing a production-ready Python script to calculate, plot, and rebalance the Global Minimum Volatility portfolio monthly.

6. Dynamic Asset Allocation and ML

- Introduction to Machine Learning in portfolio construction.
- Using simple ML models for asset grouping and selection.
- Implementing a Dynamic Asset Allocation strategy based on market regime.
- Time-varying volatility and correlation modeling
- Case Study: Developing an ML-based model to switch between Momentum and Value factors in a TAA strategy.

7. Real-World Constraints and Implementation

- Modeling and penalizing portfolio Transaction Costs and Illiquidity.
- Managing Tax Considerations and other investor-specific constraints.
- Implementing a live Rebalancing Strategy with tolerance bands.
- Post-optimization analysis.
- Case Study: Analyzing the drift and turnover cost of a high-frequency rebalanced portfolio versus a quarterly-rebalanced one for a large institutional fund.

8. Thematic and Next-Generation Optimization

- Integrating ESG Scores and Carbon Footprint data into the objective function.
- Optimization for Impact Investing and thematic mandates.
- Advanced techniques.
- Future of quant finance.
- Case Study: Constructing an ESG-screened portfolio that minimizes the Carbon Intensity metric while maintaining a target level of return and tracking error relative to a major index.

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	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

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